IMPERIAL MYCOLOGICAL INSTITUTE
-8 NOV. 1935

ADVISORY

DEPARTMENT OF THE IMPERIAL COLLEGE

OF TROPICAL AGRICULTURE.

REPORT

ON THE

AGRICULTURAL DEPARTMENT,

ST. LUCIA,

1934.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

[**Price Sixpence.**]

ST. LUCIA.
Printed by the Government Printer at the Government Printing Office.
1935.

FORWARDING DISEASED SPECIMENS FOR EXAMINATION.

PLANTS.

A few fragments of a diseased plant are of practically no value for scientific investigation. Sufficient materials should always be sent so that the primary cause of the trouble may be located.

Full particulars should be given as to the nature and extent of the damage *done*, the part of the plant attacked, the nature of the soil, drainage, the prevalence of the disease, when it was first noticed, and whether any similar kind of disease has previously been observed in the neighbourhood.

Specimens of portions of plants attacked by fungi may be sent green, packed in a well-ventilated box if the time taken for delivery is under 24 hours, but if delivery takes a longer time, all leaves or soft fruits should be placed in a bottle or corked tube containing a solution made of one part rum or methylated spirit, and two parts water. As many stages of the disease as possible should be sent, with notes as to the nature of each stage.

All specimens should be accompanied by detailed particulars of the nature of the disease, and shall be addressed to:—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

INSECTS.

Observations and specimens of economic importance or otherwise will always be gladly received. The following directions should be observed in this respect:—

Living insects should be packed with a supply of the plant on which they are found feeding and the box should have some small holes pierced for the purposes of ventilation. These should be carefully packed in such a way as to prevent their becoming crushed in transit.

If it is desired to preserve specimens they should be put up in bottles with tightly fitting corks. Methylated spirits, diluted rum, etc., make excellent preserving fluids.

Scale insects, etc., should be forwarded on the portion of the plant on which they are found.

If in doubt as to the best method of forwarding specimens, a letter should be sent asking for instructions and stating full details.

In all cases full particulars should be forwarded as to the nature and extent of damage done, along with any other important points that may have been noticed.

All specimens should be addressed to:—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

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LETTER OF TRANSMITTAL.

12th June, 1935.

Sir,

I have the honour to submit attached herewith the Annual Report of the Agricultural Department, St. Lucia, for the year ending December 31st, 1934.

2. The year was the driest the Colony has experienced in the last 45 years, a rainfall of 73 per cent. of the average being recorded. Owing however to the excellent distribution of the rainfall, there were no long periods of severe drought and consequently the agricultural industries received no serious setback.

3. The total export value of the products of agriculture and related industries was almost equal to that of the previous year at approximately £92,000.

4. The chief industry of the Colony, the sugar industry, has been enabled to maintain its existence by the aid of the preference granted to Colonial sugars. Market prices for sugar actually reached lower levels than in previous years: consequently little development has been possible. It is however gratifying to record that some general improvement has been made, both in cultural methods and general agricultural policy and also in factory management and efficiency. It may be confidently expected that these improvements will lead to greater output in the near future.

5. The appointment of Mr. H. E. Box as adviser in Entomology to this Department, with his headquarters in St. Lucia, and the financial assistance rendered by the sugar interests of the Colony have made possible the initiation of the biological control of the sugar cane moth borer (*Diatraea saccharalis*). Through the courtesy of the Sugar Cane Investigation Committee in Antigua and the British Guiana Sugar Producers' Association the parasites *Lixophaga diatraeae* and *Metagonistylum minense* respectively have been introduced and established in certain sugar cane districts. It may be expected therefore that the damage caused by this major pest will be greatly reduced in the future.

6. The lime industry was the next most important industry during the year. The export value of lime products rose from £15,778 in 1933 to £21,852 in 1934, owing mainly to a carry-over of lime oil from 1933. There was a notable increase in the export of green limes to Canada and U.S.A.

7. The discovery during the year of the existence in the Colony of the red root disease of limes makes it essential for lime cultivators to change over from the susceptible seedling limes to limes budded on the resistant sour-orange stock. The Agricultural Department has made arrangements to supply the necessary budded plants, and it is to be hoped that lime cultivators will avail themselves of the plants thus provided.

8. The coconut industry has become slightly more important relatively, the increased value of exports being due to the greatly increased shipments of nuts to Canada and U.S.A. The large size and good quality of locally grown nuts has created a greater demand for them in the northern markets in preference to nuts produced in several of the other Islands.

9. The cocoa industry no longer holds a position of major importance. The market remained depressed throughout the year and further reductions in the area under cacao are recorded. A first step however has been taken towards the improvement of the industry in the introduction from Trinidad, through the courtesy of the Trinidad Cacao Research Committee, of seed of selected heavy yielding and good quality varieties.

10. The establishment of a five year contract with the Canadian Banana Company for the export of bananas has given great impetus to the banana industry, which may now be expected to become one of great importance to the Colony. The total estimated area under bananas had risen by the end of the year to 570 acres, and an extensive survey, involving the examination of a little more than 120,000 stools, revealed that the percentage infestation with Panama disease was only 2.5. The Agricultural Department is paying strict attention to the issue of planting material free from disease.

11. The importance of the banana industry has been recognised by the generous arrangement of the United Fruit Company whereby an officer of the Department of Agriculture was sent at the Company's expense to Jamaica to study the methods of cultivation, harvesting and marketing practised in that Colony. The information and experience gained on this visit were of great value in the subsequent preparation and publication by the Agricultural Department of a handbook on banana cultivation in St. Lucia.

12. Little progress has been made in the extension of the small grapefruit industry. Planters have apparently been discouraged by the rapid development of grape fruit cultivation in other parts of the Empire and by the fear of low and uneconomic returns. The infrequency of shipping opportunities has also reacted unfavourably towards the expansion of the industry locally.

13. The propagation of budded citrus fruit trees was maintained on a large scale, and adequate attention was paid by the Agricultural Department to the development of the fruit industry in general.

14. A detailed and valuable account of the work conducted at Union Experiment Station is recorded in the Report. The progress of the work and the information already obtained will no doubt be of great value to the planting community.

15. The report on Agricultural Instruction in the Primary Schools exposes the need of a better system of agricultural training for teachers.

16. The services of Captain H. V. Metivier, Government Veterinary Surgeon, Trinidad, were kindly loaned by the Government of Trinidad for the purpose of making a survey of livestock problems in the Colony. As a result of the criticisms made and advice given during this visit, the Agricultural Superintendent was able to compile and publish a useful pamphlet entitled "Problems of Livestock in St. Lucia".

17. The progress of deforestation has reached a stage which merits careful control. The establishment of a definite policy in the matter of forest reservations is urgently needed.

18. General improvements have been effected in the Botanic Gardens, which in consequence have been rendered more attractive and useful to the Public.

19. I am satisfied that the Agricultural Department has again made a valuable contribution to the revival of Agriculture and to the improvement of the agricultural industries of the Colony, and the officers of the Department are to be congratulated on the useful work they have accomplished during the year.

I have, &c.,

G. A. JONES,
Commissioner of Agriculture.

The Honourable,
The Acting Administrator,
St. Lucia, B.W.I.

STAFF OF THE AGRICULTURAL DEPARTMENT, ST. LUCIA.

E. A. Walters, F.R.H.S., F.R.M.S.	Agricultural Superintendent & Land Officer.
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G. M. Glasgow	Agricultural Officer & Fruit Inspector.
E. L. Daniel	Foreman, Union.
G. A. Beaubrun*	Chief Clerk & Accountant.
C. E. Charles	Acting Clerk & Accountant.
Miss A. Inglis	Clerk to Agricultural Superintendent.
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Government Marketing Depot.

A. E. Adey	Supervising Engineer, Government Cold Storage Plant.
A. F. Nichols	Manager, Government Marketing Depot.
J. F. Girard	Clerk & Chief Packer, Government Marketing Depot.

* Absent. Acting Revenue Officer and Keeper Spirit Warehouse.

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SAINT LUCIA.

Report on the Agricultural Department for the year ended December 31, 1934.

WORK IN THE BOTANIC GARDENS, AND OBSERVATIONS OF PLANTS.

A very dry year was experienced in the Botanic Gardens in general with the rest of the Colony, and while this retarded the establishment of hard-wooded ornamentals in the Gardens, the dry weather allowed of more extensive replacements to permanent features such as roads and drains, and the continued reclamation of the normally wet areas by raising these with carted soil and rubble, and replanting with Casuarina.

The Gardens are now becoming much better drained than in the past, and it has been possible to maintain several good lawns in Java grass (*Polytrias praemorsa*), along the main road. These have been bordered with decorative Crotons planted in beds edged with concrete.

Attention was given to repairs and improvements generally, including the construction of 1,300 feet of concrete drains, and 400 feet of concrete supporting walls along the public roads. An attractive shelter in concrete and wood was erected in place of the former wooden structure which was in bad condition.

A portion of the waste land which was planted and drained with Casuarinas in 1931—1934, has now been cleared for installation of a Children's Playground, for the smaller children of the neighbourhood. This has become possible through the generous response of certain local residents to an appeal for gifts in kind, in order to provide a safe recreation ground for juveniles. The innovation will relieve the rest of the Gardens from the deterioration following uncontrolled games, and should not detract from the general amenities of the Gardens. It is proposed to erect the necessary swings, see-saws, &c., and a drinking fountain, from the gifts received for this purpose.

The usual flowering trees and shrubs made an attractive show during the dry season, among these being *Brownea grandiceps*, *Cassia spp.*, *Lagerstroemia Flos-reginae*, *Tabebuia spectabilis*, and *Bougainvillaea spectabilis var. laterita*.

The addition of the handsome climber—*Congea tomentosa*, to the flowering plants of the Gardens, has been very successful. In growth and floriferousness this compares well with the native climber, *Petrea volubilis*.

The usual nursery work on economic and ornamental plants for sale was carried on during the year, and contracts to supply and maintain ornamentals for the saloons of the Canadian National Steamers, and the installation and upkeep of lawns and dwarf hedges on certain business and private premises locally, were carried out on reasonable rates. Free allotments of plants were made to certain Government Institutions.

It is the purpose of the Botanic Gardens to stimulate and encourage a love for plants and flowers and so to increase the number of private gardens. As a net result this has increased the demand for ornamental plants, of which a much larger number than usual was distributed (1934—1,471; 1933—600). This does not include the daily supplies of cut flowers, seeds, and cuttings.

A collection of roses forms the most popular addition to any local garden and good plants can always be disposed of. Named varieties are being imported to meet this demand and these will be topworked on to the less attractive strong-growing varieties.

A new potting-shed in concrete and iron has replaced the earlier wooden shed and includes the temporary accommodation for animals in quarantine. By making use of suitable waste material the total cost did not exceed £20.

PLANT AND SEED INTRODUCTION.

The undermentioned seeds and plants were presented to the Department and are gratefully acknowledged:—

Material.	*Received from.*
Cane plants ...	Advisory Department, Imperial College of Tropical Agriculture.
Cocoa selections (pods) ...	Advisory Department (from Trinidad Cocoa Research Committee.)
Acacia spp., *Eucalyptus*, etc., *Macadamia ternifolia* & a collection of flowering plants	U.S. Department of Agriculture.
Orange budwood; *Phlebotaenia Cowellii*; and Sweet Corn selections ...	United States Department of Agriculture, Puerto, Rico.

PLANT PROPAGATION AND PLANT DISTRIBUTION.

The propagation of budded citrus provided for by a grant from the Colonial Development Fund was continued during the year at the Union, Rabot and Dennery nurseries, a total of 20,000 sour-orange stocks being raised for budding.

The majority of these trees were intended for Grapefruit budding in pursuance of the original programme to establish 290 acres of Grapefruit as the nucleus of an export industry. During the year however, there appeared to be a marked disinclination to extend further in this new crop and planters felt extremely doubtful as to whether a market existed or would develop for this fruit.

Consequently the demand for budded trees diminished, and a small surplus of older trees carried over from 1933 was destroyed and others were topworked with oranges and limes. Every effort was made to put the true facts of the market position before the growers and towards the end of the year confidence was again becoming established. A further reason for lack of interest in this crop was the activity in banana planting, and later in the year the discovery of red root disease of limes, which turned the attention of planters to the renovation and the replanting of the lime fields with limes budded on sour orange stocks.

The supply of seedling limes formerly the principal feature of the plant demands, was accordingly cut down to a minimum, and orders for budded trees only were accepted.

For some reason not clearly defined, a heavy demand for budded oranges was experienced during the year and propagation had to be extended in this crop. The total budded citrus trees distributed during 1934 therefore amounted to 13,172 (1933—13,547).

The total acreage estimated to be established from citrus trees distributed during the past two years, together with the estimated area from trees planted up to 1933 and now bearing, is given below:—

Acreage of Citrus Crops, St. Lucia.

	Grapefruit. per acre @ 50.	Orange. per acre @ 70.	Lemons. per acre @ 70.	Limes. per acre @ 100.	Lime Seedlings. per acre @ 100.	Total Budded Acreage.
1933 ...	170	24	5	34	67	233
1934 ...	50	34	1	82	16	167
	220	58	6	116	83	400
Prior to 1933 ...	30	20	...	40	500	90
Bearing and as Exports ...	...	...	...	...	640	.
Total Acreage	250	78	6	156	1,223	490

The original scheme provided for 625 acres of budded trees (Grapefruit —290 acres, Oranges—155 acres, Lemons—80 acres, and Limes—100 acres). In view of market conditions, the issue of lemons will not be proceeded with, and more attention will be given to grapefruit and lime propagation.

The principal features of the plant propagation programme for 1935 under the balance of the Colonial Development Fund Grant will be the increased number of budded limes to be raised for replanting lime areas. Up to 20,000 trees per annum over the period 1935—1938 will be required to replace the seedling orchards now in danger from root disease, or approximately 600 acres of new orchards. In view of the large orders already taken, there is every indication that planters will be prepared to plant this area in budded trees, a very different attitude from that of past years when only seedling trees were popular.

The grapefruit programme will depend to a great extent on the readiness to plant. It is hoped that a longer view will be taken by planters of the marketing possibilities and in regard to the present inadequacy of cold storage space to the United Kingdom, two factors largely responsible for lack of faith in this crop. In this connection it should be recognised that negotiations to provide more space are being actively pursued, and that in regard to crop value, the net returns to growers under the Co-operative Citrus Association in Trinidad, are satisfactory and justify extension.

The local aspect of the grapefruit industry is therefore dealt with in greater detail in the appropriate section under "MINOR INDUSTRIES" in this Report.

A consignment of 50 surplus grapefruit trees at increased rates was forwarded to Martinique during the year.

An increase in the supply of cane plants and of sweet potato plants was made for peasants' holdings, and of new varieties of cane for sugar-estates extension. The supply of plants and vegetable seedlings was decreased through unfavourable conditions due to the dry season.

The establishment of Banana nurseries is commented on under the section "BANANA INDUSTRY".

PLANTS, SEEDS, AND CUTTINGS DISTRIBUTED BY THE AGRICULTURAL DEPARTMENT DURING THE FIVE-YEAR PERIOD 1930—1934.

	1930.	1931.	1932.	1933.	1934.
Lime Seedlings	14,585	7,687	13,725	6,700	1,575
Budded & grafted limes	2,467	296	2,019	3,382	8,202
Sour orange seedlings	1,110	8,405	3,200	700	100
Budded oranges	582	512	596	1,621	2,407
Budded grapefruit	521	1,265	1,489	8,508	2,510
Budded lemons	86	392	67	361	53
Grafted mangoes	116	102	69	88	14
Grafted avocados	158	123	22	40	...
Pineapple plants	81	5,012	1,788	942	...
Coffee, Robusta	1,665	7,300	140	4,690	4,374
Coconut plants	86	...	6	6	...
Dwarf coconuts	33	4	12	76	42
Claret nuts	14	...	11	...	...
Mango stocks	...	...	...	256	10
Guava	...	...	...	4	...
Sapodilla	...	...	...	2	...
Papaw plants	530	...	...	12	...
Total Orchard Plants	22,034	31,098	23,144	27,388	24,433
Cane plants	5,895	39,594	5,949	13,324	22,308
Forest plants	225	1,878	132	108	161
Vegetable seedlings	4,287	15,378	3,200	4,615	2,725
Tanias	...	...	...	190	...
Dasheen	...	...	...	100	60
Sweet potato cuttings	...	5	6	14,202	35,200
Potato yams	...	...	3,352	4	5
Plantain suckers	...	...	141	95	...
Bananas	...	...	122	140	357
Total Economic Plants	32,441	87,953	33,046	60,166	85,249
Green dressing seed (lb.)	160	119	46	5	18
Fodder plants & grasses	226	55	...	646	...
Pasture grasses	...	...	...	470	663
Lemon grass (stools)	...	...	...	600	300
Ornamental plants & cuttings	285	491	486	443	1,471
Hedge & fence sticks (bundles) ...	...	...	...	3	6

NOTES ON PLOTS ESTABLISHED AT THE AGRICULTURAL STATION, UNION.

CITRUS ORCHARD.

Grapefruit.

These trees formed part of the original "Marsh" and "Duncan" importation from Florida in November, 1928. In general, they have made satisfactory growth, although slower than usual because of the prolonged dry season, and their shape continues to improve now that little budwood is taken from them. The trees of the Duncan variety (which was at first the slowest-growing variety) are now growing more rapidly than the Marsh variety and both are surpassed by the trees inarched with the local Sour orange stocks.

All the trees fruited during the year, Marsh in December to January, and Duncan in January to March, each carrying from 2 to 98 fruits of good shape and size.

Oranges.

The trees continue to make satisfactory growth and most of them carried good crops, the number of fruit on one of the trees being 395. In 1933 up to 150 fruits were carried.

Limes.

The development of the budded limes on this somewhat heavy bottom land has been disappointing and most of them have suffered from die-back of the branches, which seems to be due to a combination of root damage by root-eating larvae, and a severe dry season resulting in soil-cracking and scale-insect infestation.

These trees have been inarched with Sour orange stocks, but sufficient time has not yet elapsed for this operation to show any beneficial effects.

Lime Hybrids. One of the trees of the back-crossed Hybrid Lime No. 178 fruited for the first time. The fruit is very elongated in shape and has a rough skin which would tend to make it unsuitable as a commercial substitute for the West Indian lime. Lime Hybrid T1 is still the nearest approach to the West Indian Lime and this variety will be propagated if necessary, for estate trials.

Lemons.

All these trees are making good growth and all of them carried small crops.

Intercrops and Manures.

Crotalaria sericea, horse-beans, and black-eye peas were used as cover crops, and during the dry weather the trees were mulched with lemon grass. Fertilisers were applied as follows:—

Fertiliser Application	Trees—5 years old.	2—3 years old.
January	3 lb. Citrus Fertiliser. *	1½ lb. Citrus Fertiliser.
July	1½ lb. Citrus Fertiliser. 1 lb. Sulphate of Ammonia.	1 lb. Citrus Fertiliser. 1 lb. Sulphate of Ammonia.

* 6% Ammonia.
9¾% Potash (K_2O).
14½% Phosphoric Acid (Water soluble P_2O_5).

The Purple scale (*Lepidosaphes beckii*, Newm.) and the Snow scale (*Chionaspis citri*, Comst.) were very troublesome during the prolonged dry season. Satisfactory results were obtained by frequent spraying with 3% Sulphemulsol.

The fruits on the orange and grapefruit trees were again badly disfigured by rust-mites.

GRAPEFRUIT ORCHARD.

Selections—Ruby, Corinth and *Union Vale, 1933.* Most of the trees in this plot made good growth although subject to check by the severe dry season. The majority flowered but were not allowed to set fruit.

The orchard rows were cover-cropped with black-eye peas and inter-planted with the I.C.2 banana seedling, Gros Michel, and Giant Cavendish bananas.

Fertilisers:
July: ¾ lb Citrus fertiliser per tree.
December: ¾ lb. Citrus fertiliser and 1 lb. Sulphate of Ammonia.

The beds between the orchard rows were utilised for producing budded

citrus plants for distribution in 1935 and these made very satisfactory growth during the year.

ORCHARD SECTION.

Mangoes.

These trees made rapid growth and provided scions for purposes of grafting by approach. Trees of all the varieties fruited during the year, those of the Julie and Graham varieties setting particularly good crops.

Oranges.

All the trees made good growth and carried a crop, the flavour of most of the fruits being distinctly better than that of last year's crop.

"*Russet fruit*"

The market value of the crop was seriously depreciated by russeting due to Citrus mite. Russeting was pronounced on Washington Navel fruit which ripened in September to October and set from the *natural* main bloom of January to March, but notably absent on Late Valencia and other fruit ripening for March (1935), and set from an *induced* main bloom in July, following the rapid growth made from the onset of the rainy season. This is briefly outlined below for convenience:—

	Variety.	Main Bloom.	Small Bloom.	Fruit.	Citrus mite Effects.
Dry Season Bloom—January—March.	Washington Navel	January—March	... ...	Sept.—Oct.	Severe
	Late Valencia.	... ...	January—March	,, ,,	,,
	Ruby	... ...	,, ,,	,, ,,	,,
	Pineapple	... ...	,, ,,	,, ,,	,,
Wet Season Bloom—June—July.	Washington Navel	... ...	June—July	March (1935)	Absent
	Late Valencia.	June—July	... ...	,, ,,	,,
	Ruby	,, ,,	... ...	,, ,,	,,
	Pineapple	,, ,,	... ...	,, ,,	,,

The periodicity shewn above indicates that weather conditions being normally dry, the fruit produced from the natural seasonal bloom will be liable to attack and disfigurement by mites during this period of their increased activity.

It will be interesting to note whether further observations during the same period annually confirm this theory. If confirmed it may be profitable to induce late-blooming in districts where rust-mites are prevalent, by means of irrigation, or applying fertilisers, or both, for the production of a March to May crop, having due regard to the market demand at this season of the year. (c.f. under MINOR INDUSTRIES—ORANGES.)

Avocado Pears.

One tree each of the St. Anne and Dickenson varieties died during the year, having suffered from a similar root-breakdown to those that died in the Demonstration Orchard, as described in the Annual Report for 1933. The leaves of two Fuerte trees have also turned yellow, one of the first symptoms of breakdown. The entire collection of Avocados is therefore being reproduced, and an upland site is being selected.

The other trees in this section flowered but very few set fruit, being affected by the severe dry season immediately following the flowering.

Limes.

Trees of the Woglum and Tahiti varieties all made good growth and carried a crop.

The West Indian Limes made a satisfactory growth, with the exception of three trees suffering from die-back. These have been inarched with Sour orange stocks.

The orchard trees in this section received 3 to 6 lbs. of citrus fertiliser, and mulch. Cover-crops of *Crotolaria sericea*, *C. Usaramoensis*, and Horse-beans were maintained, and about 5,800 sour orange stocks were planted in beds for budding to limes and oranges in 1935.

The Purple and Snow scale-insects were again troublesome during the dry season, and were controlled by spraying and scrubbing with 3% Sulphemulsol.

Budded Lime Manurial Experiment Plot.

On the whole the growth of the trees in this plot has been good. Two trees were replaced during the year as they had failed to make satisfactory growth for a period of two years. Five trees of the close-growing erect type, illustrated in Fig. 2 of the 1932 Report suffered from branch fracture, from the weight of a small crop carried. These also had to be replaced.

A small crop of fruit was set in February, and a heavy blossom was produced in July and set a good crop.

Three general flushes of growth were made in the three months April, July, and December, and two small flushes were produced in February and October.

A low incidence of withertip, and heavy infestations of the Purple and Snow scale-insects are to be recorded; these are presumably the results of a very dry year. The scale insects were controlled by spraying with 3% Sulphemulsol.

Mulch.

Lemon grass was planted on beds three feet wide between each orchard row with a drain on each side, and forty pounds of wilted lemon grass mulch were applied to each tree during the year. The lime rows were forked and round-ridged with soil lifted from the drains and the plots were cover-cropped with Horse-beans.

Fertilisers.

The fertiliser applications per tree were as follows, in two equal doses applied in January and July:—

Plot.	Sulphate of Ammonia.	Sulphate of Potash.	Superphos-phates.	Control.
	3 lb.	3 lb.	5 lb.	Nil.

Measurements of the experiment trees were taken in January and July and records of tree behaviour were made as occasion arose.

From the middle of August, weekly collections of yellow limes were made by numbers and weight of fruit from each tree. The bulk of the crop ripened in October and November.

As sufficient data becomes available, a detailed analysis of the work will be prepared in co-operation with the specialist staff of the Imperial College of Tropical Agriculture through the Advisory Department. In the meantime, the following general remarks on the 1934 crop are given for the benefit of lime-planters interested in this work, but no recommendations are made at the present stage of the experiment:—

1. The Sulphate of Ammonia plot gave the greatest number of limes, and the Control plots gave the smallest number of limes.

2. The Sulphate of Potash and the Superphosphate plots were intermediate between these extremes.

3. The Sulphate of Potash plot produced a heavier crop by *weight* than that of the Sulphate of Ammonia plot.

4. Variations in yield were very marked in plots receiving the same treatment, and also in trees in the same plot.

Withertip Disease Experiment on Budded Limes.

These trees were planted in October 1933 and have grown well, most of them fruiting during the year.

With improved drainage the soil conditions of this plot have become more suited to tree crops. The mounds on which the trees were planted have been considerably extended to allow for the extension of the root systems.

Fertilisers.

In July each tree received 1lb. Citrus fertiliser.

In December each tree received 1 lb. Sulphate of Ammonia.

The orchard rows were cover-cropped with *Crotalaria sericea* and this greatly assisted in keeping weeds under control. The "Shade" plots have been planted with Immortelle (*Erythrina velutina*) 50 feet by 60 feet apart, and a temporary shade of Gliricidia has also been planted.

Coconut Plot.

The Dwarf Coconut trees continued to make satisfactory progress and thirteen of the twenty-five trees in this plot are fruiting.

The trees of the selected local varieties are making satisfactory growth, twelve trees have flowered and six are now bearing fruit.

Sugar-Cane Plot.

The sugar-cane varieties have all made good growth in spite of the prolonged dry season. Plants of the new Coimbatore cane—Co.213, were distributed at the end of the year, and there was a good demand for cuttings of the B.2935 and BH10(12) varieties. The following varieties of sugar-cane were maintained in the plots during the year:—

B. 4507	B. 409	B. 891	M. 3	P. O. J. 2878
B. 67	B. 417	B. 726	M. 7	P. O. J. 2727
B. 156	B. 472	B. 2935	M. 42	P. O. J. 2725
B. 208	B. 374	BH 10 (12)	Sc. 12/4	
B. 6388	B. 381	Ba 11569	P. O. J. 2714	

Demonstration Orchards.

Plot 1. Orange.

The growth of these trees has been good, and a small setting of fruit was made in January and March. There was a general flowering in July from which a good crop was set, some of the trees carrying up to 273 fruits. Having regard to the age of the trees (3—4 years) the quality of the fruit was regarded as satisfactory, although the juice was somewhat tasteless, that from the Parson Brown fruit having the best flavour.

Slaked lime 15 cwt. was applied to this plot, and each tree received fertilisers and mulch as follows:—

January.	July.	November.	December.	February.
2 lb. Citrus Fertiliser.	2 lb. Citrus Fertiliser.	2 lb. Sulphate of Ammonia.	Mulch.	Mulch.

Round-ridging of the beds was completed and the drains were kept open. Intercropping on a reduced scale with plantain, bananas and black-eye peas was continued.

Scale insects were controlled by washes of 3% Sulphemulsol, The fruits were discoloured by citrus rust-mites, that of the Temple orange being particularly susceptible to damage.

Costs & returns.

Plot 1, ORANGE, 1 acre. (72 trees—25 feet x 25 feet).

Expenditure.				Revenue.			
1934.	£	s.	d.		£	s.	d.
(a) *Orchard trees.*				(a) *Orchard trees.*			
Tilling		14	10	336 oranges		10	0
Draining	1	9	1				
Upkeep	4	16	3	(b) *Intercrops 1933.*			
Lime	1	7	6	Yams 365 lb.		15	2
Fertilisers	2	3	0	Tanias 54 lb.		2	3
(a) c/d	10	10	8		£1	7	5
(b) *Intercrops.*							
Black-eye peas :							
Sowing & reaping ..		3	0	1934 (b).			
Potato yams :				Bananas 17 bunches ...		5	1
Reaping		7	2	Black-eye peas		4	7
(b)		10	2				
(a) b/d	10	10	8				
Total Expenditure ...	£11	0	10	Total Revenue ...	£1	17	1

Plot 2. Grapefruit.

The growth of the trees in this plot has been excellent and a good crop of fruit was set in July, one of the trees carrying 217 fruits.

During the year 12 cwt. of slaked lime was broadcast and forked in, and fertilisers were applied.

Fertilisers.

In January and July: 2½lb. per tree. (citrus fertiliser).

In October: 3lb. Sulphate of Ammonia per tree.

The cultivation of this plot was similar to that of the orange plot, and black eye peas were intercropped. *Indigofera endicaphylla*, a new introduction, is being established as a cover crop and is proving very satisfactory.

Costs and returns.

Plot 2, GRAPEFRUIT, 1 acre. (72 trees—25 feet x 25 feet).

Expenditure.				Revenue.			
1934.	£	s.	d.		£	s.	d.
(a) *Orchard trees.*				(a) *Orchard trees.*			
Tilling		16	6	150 grapefruit		10	0
Draining	1	3	0				
Upkeep	5	1	3				
Fertilisers	2	17	0				
Lime	1	5	0				
(a) c/d	11	2	9			10	0
(b) *Intercrops.*				(b) *Intercrops.*			
Black-eye peas				Black-eye peas		9	10
Sowing & reaping ...		3	6				
(b)		3	6				
(a) b/d	11	2	9				
Total Expenditure ...	£11	6	3	Total Revenue ...		19	10

Plot 3. Avocado Pears.

Twenty-two of the forty-eight trees in this plot have succumbed from the unsuitable soil conditions described in last year's Report, all the varieties having lost trees with the exception of the local variety Galvana, which is proving adaptable to lowland conditions.

The drains have been kept open and the beds round-ridged, and intercrops of black eye peas, tanias and bananas have been grown to a limited extent.

Costs and returns.

Plot 3, AVOCADO PEARS, 1 acre. (48 trees—30 feet x 30 feet).

Expenditure.	£	s.	d.	Revenue.	£	s.	d.
1934.				1933.			
(a) *Orchard trees.*				(b) *Intercrops.*			
Tilling	1	12	10	Tanias 42 lb.		1	9
Draining		14	3	Yams 437 lb.		18	2
Upkeep	7	13	1				
Fertiliser		8	0				
(a) c/d	10	8	2			19	11
				1934.			
(b) *Intercrops.*				(b) *Intercrops.*			
Black-eye peas				Black-eye peas 11 lb. ...		2	9
Sowing & reaping ...		1	3				
(a) b/d	10	8	2				
Total Expenditure ...	£10	9	5	Total Revenue ...	£1	2	8

Plot 4. Mangoes.

The trees are developing rapidly and are well shaped. Fifteen Julie trees and one of the Peach variety fruited this year and 299 fruits were sold.

The trees were mulched and the plot was intercropped with black-eye peas. No fertilisers were applied.

Costs and returns.

Plot 4, MANGOES, 1 acre. (48 trees—30 feet x 30 feet).

Expenditure.	£	s.	d.	Revenue.	£	s.	d.
1934.							
(a) *Orchard trees.*				(a) *Orchard trees.*			
Tilling	1	15	10	299 mangoes		12	5
Draining		12	8				
Upkeep	3	1	3				
(a) c/d	5	9	9				
(b) *Intercrops.*							
Black-eye peas				(b) *Intercrops.*			
Sowing & reaping ...		5	6	Black-eye peas 39 lb. ...		8	1
(a) b/d	5	9	9				
Total Expenditure ...	£5	15	3	Total Revenue ...	£1	0	6

Summary of Costs & Returns for 4 years—Demonstration Plots.

Year.	Orange—1 acre.						Grapefruit—1 acre.					
	Expenditure.			*Revenue.*			*Expenditure.*			*Revenue.*		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1931	12	3	10	4	11	5	23	17	7	10	5	8
1932	22	18	4	14	1	0	18	11	7	14	9	8
1933	14	8	8	5	12	3	20	6	2	4	13	4
1934	11	0	10	1	17	1	11	6	3		19	10
	£60	11	8	26	1	9	74	1	7	30	8	6
	To Balance			£34	9	11	To Balance			£43	13	1

Year.	Avocado—1 acre.						Mango—1 acre					
	Expenditure.			*Revenue.*			*Expenditure.*			*Revenue.*		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1931	14	13	9	3	10	0	10	18	11	1	16	4
1932	16	1	10	9	6	9	13	11	6	9	0	0
1933	17	5	8	2	13	0	6	10	5	3	8	10
1934	10	9	5	1	2	8	5	15	3	1	0	6
	£58	10	8	16	12	5	36	15	1	15	5	8
	To Balance			£41	18	3	To Balance			£21	9	5

Total *net* costs to date by debit balances 4 years—4 acres: £141 10 8.

This is equal to an annual *net* cost on the first four years at the rate of £8 16 11 per acre.

Comparative Cost of raising one acre Fruit-trees (not including Provisions) 4 years.

Year.	Orange.			Grapefruit.			Avocado.			Mango.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1931	5	4	2	4	19	5	11	1	8	3	0	3
1932	12	11	8	12	15	4	12	16	2	7	17	10
1933	12	18	8	16	3	0	15	6	2	3	19	11
1934	10	10	8	11	2	9	10	8	2*	5	9	9
	41	5	2	45	0	6	49	12	2	20	7	9
Add cost Nursery propagation of trees	3	12	0	3	12	0		12	0	2	8	0
Total ... £	44	17	2	48	12	6	50	4	2*	22	15	9
Unit cost per tree ...	12/6½.			13/6.			£1	0	11.	9/6.		

* 26 trees lost from disease.

Extension Plot.

Five Lue Gim Gong orange plants budded from imported Puerto Rico budwood were planted during the year, and all the trees in the plot have made good growth. The Foster's Pink grapefruit trees (1932) set an excessively heavy crop and about half of this had to be thinned out to prevent injury from overbearing.

Lemon-grass mulch, and from 2 to 4 lb. of citrus fertiliser was applied to the trees according to age, during the year. The trial plot of Gros Michel bananas planted in 1933 was found to be infected with Panama disease, and all the plants were destroyed.

The plots were intercropped with maize, black-eye peas, yams and sweet potatoes.

AGRICULTURAL CADETS.

Three boys were selected from a total of 17 applicants to take the 1st year course as Agricultural Cadets at the Union Experiment Station. Three 1st year boys satisfactorily performed their duties in 1933, and were retained as 2nd year Cadets.

The study courses and general arrangements were under the control of the Assistant Superintendent and the Agricultural Officer. The curriculum of the theoretical course was enlarged to deal with Animal Husbandry and Elementary Veterinary Science.

The Cadets assisted in all of the important operations performed at the Station and the 2nd year Cadets accompanied officers of the Department on field excursions to various estates. On these excursions every opportunity was taken to give them useful information on the estate management of crops.

Through the courtesy of an estate proprietor the best 2nd year Cadet was enabled to spend the month of November on an estate, acquiring knowledge of the management of citrus, cacao and coconut crops under estate conditions.

The Cadet made good use of this opportunity, and the Department here records its appreciation of the facilities which were so willingly accorded him. Supplementary training of this nature is a most beneficial and practical extension to the Departmental training, and it is to be hoped that other estate managements will be able to assist in this direction in future.

Oral and theoretical examinations were held in December and the following marks were obtained:—

Theory.

C. Laporte,	age 20, 71%	2nd year.
R. Bodley,	,, 18, 40%	
L. Cotter,	,, 18, 31%	
A. Herman,	,, 18, 58%	1st year.
A. Bonaparte,	,, 16, 52%	
S. Edward,	,, 16, 41%	

The marks obtained were satisfactory with the exception of two of the second year boys. These boys have always found it difficult to express themselves in written examinations, whereas their practical work and general knowledge is satisfactory.

Oral.

The questions were answered intelligently and showed that interest had been taken in the work during the year.

General.

The majority of applicants for the course are somewhat undersized and their physique is not well-developed. At the conclusion of the two-year course it has been observed that the systematic dieting and regular habits promoted during the course have in most cases effected a noticeable improvement in the physical constitution and alertness of the Cadets.

At the termination of the course two Cadets were employed as nursery assistants in the Department. The others returned to their parents' holdings and are able to avail themselves of the free grant of 5 acres of Crown Lands allowed by Government.

Four ex-Cadets have been settled on the land in this manner since 1933, and nine ex-Cadets in all are now engaged in agricultural work.

FOREST CONSERVATION.

No special work was done on Forestry during the year. A better knowledge of the extent and value of the forest area was however obtained from the frequent tours made in pursuance of an investigation of agricultural settlement and banana planting, in particular that of the Murray Road area (South-central) where land was selected for a scheme of Peasant holdings, for which funds were applied for under the Colonial Development Fund Act, in November, 1934.

Attention to the problem of the destructive burning of forest land preparatory to planting crops e.g. Bananas, has shown that burning is unnecessary, and is also expensive even in the early years of an agricultural crop. A practical demonstration of the method and costs of opening forest land without burning has been carried out in the three Banana nurseries during the year and the results are definitely favourable to non-burning.

In the case of bananas the method consists of four main operations:—

I. Clearing low bush and small trees.

II. Planting the crop: Opening drains and tracks.

III. Felling the heavy timber.

IV. Chopping and reducing the branches and trunks as convenient, to allow the free growth of the crop.

This method suitably modified should be applicable to crops other than bananas, and if it can be demonstrated that the majority of peasants' crops can be more economically planted without burning, will bid fair to revolutionise peasantry development in the best lands. Under the present system these are invariably burnt and suffer subsequent deterioration.

Further details of this method and its results are being published in the handbook of Banana planting referred to under the section—BANANAS—in this Report.

There was again a relatively high output of forest products not including local consumption as compared with earlier years. Hewn timber and posts valued at £727, and 89,238 bags of charcoal valued at £4,486 were exported, a total value of £5,213 (1933—Charcoal 85,840 bags at £4,327). Of the charcoal exported, 64 per cent. was shipped to Martinique, a forested island, and the remainder mainly to Barbados which possesses no forests. Taking export production only, this is equal to 357 acres of cleared woodland per annum when calculated at 256 bags of charcoal produced from 1 acre of woods, and if continued at this rate over 40 years would account for the deforestation of an area equal to the entire Crown Lands in forests—approximately 12,000 to 13,000 acres, or 13 per cent. of the Island area.

Where charcoal production is concerned with the clearing of lower and drier areas for permanent gardens, or with heavy forest for clearing and planting in a crop, this is not, *prima facie*, to be condemned, provided adequate restorative measures ensue. There is, however, a growing practice indulged in by irresponsible individuals who are primarily concerned with obtaining ready cash, of clearing and destroying wood-land for the charcoal export trade only These take no measures to protect the cleared land by planting trees or cropping with gardens. The waste land thus resulting is frequently called 'pasture', whereas it is obviously a stage in the downward progress of deterioration of land leading to aridity and climatic change.

For a better comprehension of the undirected exploitation resulting from lack of a forest policy, the following statistics should be consulted.*

Colony Area Acres 152,320.	Alienation of land. Acres.	Exports. (a) Charcoal bags.	Exports. (b) Timber † £ Value.	Imports of Timber ‡ £ Value.
1924 ...	77,655	23,027	1,021	442
1925 ...	77,701	29,189	843	113
1926 ...	137,969	32,396	771	873
1927 ...	137,974	38,205	563	1,778
1928 ...	138,069	46,372	496	9,140
1929 ...	138,145	42,879	653	3,185
1930 ...	138,145	42,324	873	1,212
1931 ...	138,194	39,803	872	1,813
1932 ...	138,316	79,960	636	1,308
1933 ...	138,721	85,840	689	1,073
In 10 years ...	61,066	449,995§	£7,417	£20,937
1934 ...	138,736	89,238	629	184

* This record does not include the local consumption of fuel (factory and otherwise) or of charcoal.
† Excluding logwood. ‡ Excluding shooks. § Equal to 1,839 acres woodland.

During the year an application for the joint services of a visiting Forestry officer on a tour of investigation through certain British West Indian forest areas, was made to the Colonial Development Fund Committee, and it is expected that a visit will be made to St. Lucia during 1935. The problem of introducing more thrifty utilisation of the forest and its products is one of the most urgent matters to be dealt with. The extent of forest now being exploited for the banana crop is of considerable total area, and if such allotments continue without proper regard to the scientific principles of conservation and re-establishment, this denudation will have very serious consequences for the general welfare of the Island, from floods, erosion and drought. The appointment of a responsible authority such as a Forest Conservator is a safeguard that should be no longer delayed.

CONTROL OF INSECT PESTS.

Moth-borer of Sugar Cane.

The work of estimating the damage done by the small moth borers (*Diatraea Saccharalis* and *D. canella*) was again undertaken by the Assistant Superintendent, and field counts were made at three estates.

The method employed was similar to that used in previous years, five stools being taken as a representative sample from each field. By adopting this procedure the size of each sample was reduced but a larger number of samples were taken, thus covering a wider area than in previous years.

Losses in Sugar-canes, Crop 1934.

Varieties.	Field Loss %		Factory Loss %	Total Loss Crop %
	Rats.	Moth-borer.		
Field 1. Plant Canes BH 10 (12) ...	7.0	27.9	4.4	39.3
,, 2. ,, ,, ,, ...	...	13.3	4.4	17.7
,, 3. ,, ,, ,, ...	...	18.2	1.8	20.0
,, 4. ,, ,, ,, ...	...	23.3	5.3	28.6
,, 5. ,, ,, ,, ...	1.6	11.6	2.8	16.0
,, 6. ,, ,, ,, ...	...	12.5	1.6	14.1
,, 7. ,, ,, B 726 ...	...	20.8	4.2	25.0
,, 8. 1st Ratoon BH 10 (12) ...	1.6	21.5	2.2	25.3
Average 1934 ...	1.27	18.63	3.33	23.25
,, 1933 ...	3.27	15.50	3.07	21.80
,, 1932 ...	2.36	12.24	2.42	17.00

	1934	*1933*	*1932*
Average borer loss in Plant Canes BH 10 (12) per cent.	= 21.2	20.3	18.2
Average joint infestation Plant Canes BH 10 (12) per cent.	= 16.6	17.4	14.1

Mr. H. E. Box, F.R.E.S., was appointed Entomologist to the Advisory Department, Imperial College of Tropical Agriculture, in conjunction with his principal duties on moth-borer control, and has thus become available for advisory and field assistance in connection with insect pests of general crops.

The fuller reports on the progress of Moth-borer investigation are therefore published separately by Mr. Box and are obtainable from the Imperial College of Tropical Agriculture.

White Root Grubs of Citrus.

Citrus trees on Sour orange stocks in certain lowland areas, including Union Station, have been attached by white root grubs and seriously affected by die-back as a consequence of the continued destruction of the root. In the larval condition this pest spends a long period in the soil—up to 10 months—during which period it eats away the cortex of the main and secondary roots, thus exposing the xylem or woody core of the root to water-soaking and subsequent decay.

The application of soil insecticides such as the fumigant Paradichlorbenzene, has not been successful to any extent through the compact nature of soils in bottom lands preventing free dispersion of gas, and it is hoped that the problem can be approached by means of biological control, from the use of predators of the insects in question. This matter has accordingly been referred to the Entomologist for his co-operation.

General.

The usual infestations of scale-insects on coconuts and on citrus, and of weevil and borers of bananas have been observed; the former to a somewhat greater extent than usual owing to the continued dry weather. The use of Sulphemulsol has been generally encouraged for washing and spraying citrus trees.

The control of banana root-borers seems confined mainly to the sanitation and clean conditions of planting and maintenance of the fields. The method of sectioning banana stools for planting material has in general proved most successful in the prevention of infestation in new fields.

CONTROL OF FUNGUS DISEASES.

Citrus Diseases.

The most important subject under this head during the year was the recognition of Red-root disease of limes (*Sphaerostilbe repens*).

This was first observed in the Soufrière district through the activities of the proprietor of a large lime area, where seedling limes principally above 15 to 20 years of age were found to be wilting and dying rapidly, the conditions being emphasised in low areas and riverside plantings.

The confirmation of the disease by the Mycologist, Imperial College of Tropical Agriculture through the Advisory Department, gave rise to serious misgiving among the lime planters, since the largest proportion of estate lime trees were the susceptible seedling trees, the budded trees being unpopular up to this date. It was again pointed out that the only method of safe establishment of the lime industry was the full adoption of the Sour-orange stock in present and future orchards.

A comprehensive survey of the lime-fields was made throughout the Island, at the end of which it was possible to estimate the probable losses from disease annually.

General scattered infection was found in practically all the older orchards, the fungus becoming an active parasite in poorly drained and non-aerated areas where root damage from periodical floods was evident, and existing in a passive saprophytic condition in the drier orchards.

The issue of budded limes was therefore increased to allow of rapid replanting in the severely effected areas, and no more orders for seedling limes were accepted.

The propagation programme has now been extended to allow of sufficient replacements over a period of 3 to 4 years to restock approximately 600 acres of lime-fields, and orders for these trees are being sent in at a satisfactory rate.

Wither-tip Disease of Limes.

The position of wither-tip disease of limes calls for no special comment. There was no serious loss in the total crop during the year, owing to the continued dry weather. Fruit scab also was less prevalent.

Coconut Budrots.

A service of inspection was continued through the coconut plantations, and in the Southern districts approximately 14,000 trees were examined. Thirty-seven cases of budrots and sixteen cases of little-leaf disease were recognised and treated during the year.

Panama Disease of Bananas.

The work of inspection and treatment of banana diseases was increased during the year and inspectors were provided under the supervision of the travelling officers in order to deal with the cases of Panama disease. Surveys have been made in all districts of the Colony and the extent and danger of this disease are now known fairly accurately.

In certain areas of the Soufrière district, in Canaries, Millet, Micoud and Dennery lowlying areas, the possibilities of a successful industry in bananas are remote owing to the general soil infection and frequency of disease cases. These areas should be abandoned from Gros Michel bananas.

In general the lowland areas and older cacao lands are regarded as infected and any official assistance in developing such areas is entirely a matter for the Department to decide on, with due regard to the method of planting and the locality in question

On the other hand, provided that proper methods of inspection of planting material, and selection and treatment of land are rigidly insisted upon, the new clearings on forest lands are likely to remain productive and generally free from disease for a long period.

The distribution of the disease is given below:—

District.	No. of Plants examined	Cases Panama Disease.	Per cent
Castries ...	8,640	61	0.70
Millet ...	5,695	696	12.22
Anse-la-Raye ...	6,800	43	0.63
Canaries ...	22,238	719	3.23
Soufrière ...	12,930	306	2.35
Choiseul ...	330	...	...
Laborie ...	1,020	4	0.39
Micoud ...	27,305	519	1.90
Dennery ...	37,615	771	2.04
Total ...	122,573	3,119	2.5

The total area in bananas for 1934 was estimated to be 903 acres (1933—200 acres).

Disease per cent. on total area	...	1.2%
Disease „ „ new plantings	...	0.3%

The recognised procedure of cutting down and gas-oiling the diseased plants has been instituted by inspectors generally throughout the plantations.

PLANT QUARANTINE.

The introduction of all plant material is regulated under the Plants Protection Ordinance No. 14 of 1916 (Revised), and cognate subordinate legislation. This quarantine work involves the inspection of all seeds, plants, and miscellaneous planting material and containers introduced into the Colony during the year, and is carried on in conjunction with the Post Office and Customs authorities. The introduction of soil, fruit and vegetables is further regulated by legislation under the Customs Amendment Ordinance No. 2 of 1920.

The number of inspections made during the year was 160. The number of consignments intercepted and confiscated or otherwise dealt with was 55. These consisted of corn, coconuts, grasses, diseased fruits and cotton seed.

The following schedule gives the position of legislation regulating the importation of material likely to be a means of introducing diseases or pests:—

A. *Prohibited articles, including seeds, plants, soil and packages and articles connected therewith*

Articles Prohibited.	Country of Origin.	Reasons for Prohibition.	Index of Legislation.
Plants and Seeds.	Ceylon.	General precautions.	Revised Rules, Chapter 7, Regulation 2.
Cacao plants or any parts thereof	South America, South and East of Panama.	Witchbroom disease.	Revised Rules, Chapter 7, Regulation 2.
Banana plants or any parts thereof.	Trinidad, Tobago, Central and South America.	Panama disease, root disease and insect pests.	Revised Rules, Chapter 7, Regulation 2.
Banana plants or any parts thereof.	Jamaica.	Panama disease, root disease and insect pests.	Proclamation of 8.9.17.
Banana plants or any parts thereof.	Grenada.	Panama disease, root, disease and insect pests.	Proclamation No. 6 of 1925.
Banana plants or any parts thereof.	Canary Islands and West Africa.	Panama disease, root, disease and insect pests.	Proclamation No. 13 of 1925.
Coffee, guava, mango, sapodilla, star-apple, plants, fruits, etc.	Bahamas, Ceylon, Cuba, Jamaica, India, Philippines.	Citrus Black Fly.	Proclamation of 10.2.17.
All soil, fruit and vegetables, except plantains, nuts, onions, Irish potatoes, canned, dried, and processed fruit and vegetables.	Countries other than the British Isles, Canada, and British West Indies.*	Mediterranean Fruit Fly.	Customs Amendment Ordinance No. 2 of 1920—Notice No. 7 of 1930.

* A Certificate of Origin is necessary for the non-prohibited countries.

B. *Prohibited articles except under licence and specified provisions.*

Articles Prohibited.	Country of Origin.	Reasons for Prohibition.	Index of Legislation.
Sugar-cane, corn, sorghum, fodder, grasses, and seeds of grasses. (Natural Order—Graminae).	Any place beyond the limits of the Colony.	Mosaic disease of cane.	Proclamation No. 6 of 1921.
Coconuts, Coconut plants, or any parts thereof.	From any place.	Red Ring disease, other diseases.	Proclamation No. 2 of 1924.
Cotton seed, seed cotton.	From any place.	Pink Bollworm, other pests or diseases.	Proclamation No. 3 of 1924.
Citrus plants, fruits, any parts thereof.	From any place.	Citrus Canker, citrus black fly, and general precautions.	Proclamation No. 3 of 1927.

C. *Permitted articles, provided these have passed inspection by the Agricultural Department, or are otherwise authorised to be imported.*

Articles permitted.	Country of Origin.	Index of Legislation.
Garden seeds, (not including corn, grasses, etc.) Plants, root-stocks, nuts, tubers, bulbs, cuttings, etc., free from soil, and not included under "A" & "B".	From any place.	Plants Protection Ordinance, No. 14 (1916 Rev.)

Importation of one consignment of 2 plants of Jamaica Bombay Mango from Jamaica was arranged through the Central Quarantine Station established in Trinidad.

Exportation of Plant Material.

Certificates have been drawn up to meet the requirements of Departments of Agriculture in overseas countries and of the Ministry of Agriculture and Fisheries for England, Wales and Scotland. These are necessary in any exportation of local plant material.

DISEASES AND PESTS WITHIN THE COLONY.

The following diseases and pests are "Notifiable diseases and pests" under the Plants Protection Ordinance, and the occurrence of any one of them whether recognised or suspected should be notified to the Agricultural Department:—

Coconuts—Budrot of coconuts.

Sugar-cane—Gumming disease of sugar-cane.

Bananas —Panama disease, Marasmius disease, banana weevil and borer.

Cotton —Pink bollworm of cotton.

The presence of the parasitic "love vine" and "bird vine" should also be reported.

ANIMAL QUARANTINE.

The introduction of farm animals, fodder and litter is regulated by Ordinance No. 17 Diseases of Animals, under which the Governor in Council may prohibit any importation likely to be a means of introducing disease. Visits and inspections entailed by this work are carried out by the Agricultural Superintendent in collaboration with the Senior Medical Officer.

The preparation of consolidated legislation was undertaken during the year, in order to re-enact the Animal Diseases Ordinance in conformity with present requirements locally and overseas.

The following legislation is in force to regulate the importation of animals and farm products:—

Prohibition.	Country of origin.	Reasons for Prohibition.	Index of Legislation.
Animals, not including dogs. Horses permitted by special licence. Importation allowed on production of Certificate of freedom from Anthrax.	St. Vincent, Grenadines, British Guiana, Venezuela, St. Kitts & Nevis.	Anthrax.	Notice of 16.6.17, No. 7 & No. 8 of 1918, No. 9 of 1919, No. 6 of 1930.
Animals, fodder & litter until further notice.	England, Scotland, Wales, Ireland, Isle of Man, Channel Islands.	Foot & mouth disease.	No. 103 of 2.5.24.
Animals—except with Veterinary Certificate approved by the Agricultural Superintendent.	Trinidad.	Rabies.	Regulation No. 4 of 1933 under Public Health Ordinance No. 19 of 1931.
Birds of the parrot family or subtribe *Psittacideae* except under licence.	From any place.	Psitticosis.	Customs Amendment Ordinance No. 2 of 1920, Notice No. 8 of 1930.
Queen Bees, or used bee apparatus, except under licence.	From any place.	Foul Brood disease.	Ordinance No. 18 of 1916 Revision & No. 13 of 1928.

FARM STOCK AND POULTRY.

A survey of livestock problems was undertaken by the Government Veterinary Surgeon, Trinidad, Dr. H. V. Metivier, O.B.E., B.Sc., M.R.C.V.S., by arrangement with the Government of Trinidad through the medium of the Advisory Department. Dr. Metivier accompanied the Agricultural Superintendent and the Assistant Superintendent to the various farms and districts on a tour of 10 days inspection from 13th to 22nd June. The funds for this service were provided jointly by the Government and stock-owners. In view of the interest evinced in this departure it is hoped to renew the visit in 1935.

The account of the visit has been published in a local report compiled by the Agricultural Superintendent from information provided by the Veterinary Surgeon and other sources,—"Problems of Livestock in St. Lucia". Copies of this have been circulated and others are obtainable from the Department.

The export of animals products during the year amounted to £638 as shewn below:—

	1934. £	1933. £
Animals	520	425
Poultry	16	14
Leather	5	...
Hides & Skins ...	97	122
Total ...	£638	561

The imported value of animals and animal foods, meat and dairy products including manures was £8,359, during the year.

		1934.	1933.
		£	£
Animals	...	82	73
Animal foods	...	200	175
Poultry	...	70	53
Butter	...	783	2,328
„ substitutes	...	1,378	1,692
Cheese	...	401	454
Milk	...	125	88
Meat—processed	...	1,660	1,598
—fresh	...	334	234
Manures	...	3,326	2,595
		£8,359	9,290

POULTRY:

The private importations of newly-hatched pure-bred chicks through the services of the Pan-American-Airways was continued less regularly during the year, 1,133 birds being thus imported Experience has shewn that crosses of White Leghorn with Barred Rock, gives an all-white offspring of heavier build but otherwise generally similar to the White Leghorn, including laying capacity. Mongoose attacks on the introduced docile breeds have frequently been severe but can be alleviated by including some native fowls in the flock.

GOVERNMENT FARM STOCK.

CATTLE.

There has been a popular demand for the services of the pure-bred Holstein-Freisian Bull "Gerald II" and for the $\frac{3}{4}$-bred Holstein-Zebu Bull "Arneaud". Tours have been made through four different districts for estate service during the year, and the station services have been taken in turn by the bull returned from tour.

The Agricultural Superintendent desires to commend the estate managements with but one exception, on the improved attention that has been given these animals when on tour, particularly in the matter of proper rations which is now invariably observed. The principle defect observed on the returned animals is an occasional mild infestation by ticks.

The numbers of services are recorded below :—

	1934.	*1933.*	*1932.*	*Total.*
Pure-bred Gerald II.	69	33	21	123
$\frac{3}{4}$-bred Arneaud	18*	13	...	31

* Incomplete, records still to be obtained.

The progeny of the services continue to come up to expectation, and are readily identified by being full-sized, well-developed animals, with a large bony framework and definite colouring.

PIGS.

Two Large Black boars and one sow, and one pair of Berkshire pigs, have been maintained at the Station for breeding purposes. All these animals have developed well, and two litters have been raised and sold at the nominal rate of 10/- per head from each of the sows.

Litters.		
Large Black.	February,	9 born, 7 raised (2 still births.)
	November,	7 born, 5 raised (2 killed by overlying)
Berkshire.	Ferbuary,	7 born, 5 raised (2 still births.)
	October,	7 born, 7 raised.

Total progeny up to and including 1934—37 pigs.

The health of the pigs during the year has been very good and no illness had to be dealt with. During the wet period at the end of the year the exercise run became unhealthy from the grubbing activities of the pigs. The entire yard was therefore scraped and dried and grounded with heavy road metal. A heavy surface of concrete, provided with wallows and drains, has since been installed and is proving much more satisfactory.

PROGRESS IN THE CHIEF INDUSTRIES.

SUGAR.

The year 1934 was a period of disappointment to the sugar producers in view of the delayed recovery of the sugar markets and the resulting low prices for this staple product. The sugar preference available during this period saved the position from becoming more serious, and the industry generally was thus able to maintain and even advance its efficiency by field improvements in drainage and cane-bed layout, replacements by new or improved cane varieties, and attention to factory technique. The extraction of sugar has been raised from 1 ton per 9.5 tons of cane to 1 ton per 8.8 tons, as an average over the three principal factories since 1933.

The introduction and establishment of the Cuban parasitic fly, *Lixophaga*, and more recently of the Amazon fly *Metagonistylum*, to afford a natural control of the cane moth-borer pest, has been reported as successfully accomplished, and in the near future this should result in a higher proportion of sound canes and an improved sucrose content.

The total crop production for the year was 5,498 tons of first and second sugars, of which 4,730 tons was exported. This compares favourably with production for the previous year as given below. The production of molasses and syrup was decreased somewhat, 194,000 gallons being made as against 207,000 gallons in 1933, and there was much difficulty in disposing of these products. A proportion of the molasses was utilised for the manufacture of rum for local use, and a considerable quantity still remained unsold at the end of the year. There was also no export trade in rum.

The weather was generally favourable throughout the year, although the short drought in April to June had a general retarding effect on growth and caused losses in the southern cane-fields. The crop for 1935 is therefore likely to be lower from this area, but otherwise should be satisfactory.

The total cane area has been extended by replanting operations, and is now approximately 4,500 acres, a small proportion of this consisting of small-holders' canes.

A new low record for sugar prices was reached in November—December, and the markets generally were very dull. Prices ranged from 10/6 to 11/6 in the first half of the year to 8/1 and 6/4 per cwt. f.o.b. and 8/- raw Preferential 96° c.i.f. towards the end of the year.

The following figures show the exported quantity and value of sugar products comparatively from 1930 to 1934:—

	Sugar.			Molasses.	Molasses & Syrup.		Total Value Sugar Products.
	Production tons.	Export tons.	Value £	Production gallons.	Export gallons.	Value £	£
1930	5,153	4,567	45,289	...	157,254	2,872	48,161
1931	4,572	3,973	35,554	162,000	24,837	1,194	36,748
1932	5,452	4,990	46,466	...	32,988	1,453	47,919
1933	5,474	4,940	46,493	207,000	43,260	1,417	47,910
1934	5,498	4,730	39,396	194,000	23,080	1,431	40,827

RUM

	Production p. gallons.	Export gallons.	Value £.
1930	29,918	1,597	288
1931	31,003	...	...
1932	30,415	...	...
1933	28,540	...	...
1934	25,239	...	...

Sugar-Cane Manurial Experiments.

The purpose of these experiments is to determine by means of estate treatments carried out over a series of years, the economic application of fertiliser, in the form of sulphate of ammonia and sulphate of potash, that should be made to fields of BH10 (12) cane variety under the prevailing conditions. The applications comprise incremental amounts of fertiliser on :—

(a) Plant canes
(b) Ratoon canes

This work is under the guidance of the College Agricultural Advisory Department and acknowledgement is here made of the services of Mr. P. E. Turner, M.Sc., F.I.C., Chemist, Imperial College of Tropical Agriculture, and Dr. A. E. S. McIntosh, B.Sc., Ph.D, Geneticist of the Department of Agriculture, Barbados, and of the useful information derived from their periodical visits. Appreciation of the active co-operation of the field and factory managements in the trials is also to be made.

The manurial experiment plots were started at Mont D'or Estate, Roseau, in 1932, and at Roseau Estate in 1933. At Mont D'or there are five different treatments, each treatment being repeated four times, the crop from March 1934 and onwards being in first ratoon canes. At Roseau Estate, the five treatments are repeated five times, the plots being arranged in a Latin Square of plant canes.

Yields of Canes Calculated from Weighed Returns—Crop 1933-34.

Treatments: Sulphate of Ammonia applications—March 1933.
(Also manures at planting time—15 tons pen manure per acre.)

Area. A. *Roseau* 1932-34. 25 plots of 1/30th acre. Planted December 1932. (a) Plant Cane-crop—1934.				B. *Mont D'or* 1931-34. 20 plots of 1/30th acre. Planted October, 1931. (b) 1st Ratoon crop—1934.		(a) Plant Cane Crop*—1933.		
Sulphate of Ammonia treatments—lbs. per acre.	As Nitrogen per acre.	Tons Cane per acre.	Yield Increment + or − on control.	Tons Cane per acre.	Yield Increment + or − on control.	Sulphate of Ammonia treatments—lbs. per acre.	As Nitrogen per acre.	Tons Cane per acre.
I Control	Nil.	39.64	...	27.79	...	Control	Nil.	37.9
II 150 lb.	30 lb.	41.91	+2.27	33.42	+5.63	200 lb.	40 lb.	42.3
III 300 ,,	60 ,,	42.24	+2.60	38.30	+10.51	300 ,,	60 ,,	47.6
IV 450 ,,	90 ,,	44.49	+4.85	39.88	+12.09	400 ,,	80 ,,	43.0
V 600 ,,	120 ,,	40.98	+1.34	41.06	+13.27	600 ,,	120 ,,	47.5

* N.B. Owing to the irregular increments in applications of Sulphate of Ammonia, yield results from these trials (1933) were not open to accurate analysis, and it was revised as in treatments—I to V shewn above.

Notes on Results from Treatments.

1. The average field application practised in cane farming is about 300 lb. sulphate of ammonia per acre at Roseau.
2. The crop increments from heavier applications of Sulphate of Ammonia are more marked in ratoons B. than in plant canes A.
3. The greatest increment on ratoons is that of Treatment V.—increase per acre=13.27 tons.
4. The smallest increment on ratoons is that of Treatment II.—increase per acre=5.63 tons.
5. The greatest increment on plant canes is that of Treatment IV.—increase per acre 4.85 tons.
6. The smallest increment on plant canes is that of Treatment V.—increase per acre= 1.34 tons.
7. Excessive rotting from floods and losses from moth-borer attacks have been evident in the Roseau plots particularly those receiving heavy applications of Sulphate of Ammonia—No. V. Roseau.
8. At the present stage of the experiments the application of 300 lb. Sulphate of Ammonia per acre appears to be the economic application to both plant and ratoon canes, particularly the latter.

As it has been proved that plots receiving no sulphate of ammonia yield definitely lower than fertiliser plots, the Control plots are now being utilised for combined sulphate of ammonia and sulphate of potash trials.

The following applications were made to both series of plots in May 1934:—

Treatments. I. (Controls) sulphate of ammonia 375 lb.—sulphate of potash 200 lb.
II.—V. Applications of sulphate of ammonia as in 1933.

Proposed Variety Trials.

Considerable variation is known to occur in the average cane yields, notably of the standard cane seedling BH10(12) under the two distinct types of sugar-cane environment, as described in the report of Dr. McIntosh on Sugar-Cane Variety Problems; viz:—**1.** The Roseau type—rainfall 80″—85″ per annum, prolonged wet season; soil, a clay loam; ratoons up to and above 15 years. **2.** The Vieux-Fort type—rainfall 55″—75″ per annum, marked dry season; soil, a light loam; ratoons up to 6 years.

Information as to the appropriate economic variety to be grown under these different environments is sought from a series of variety trials suggested by Dr. A. E. S. McIntosh, to be run at the respective estates from approved varieties. This should also give valuable information on the early or late crop value of varieties.

LIMES.

The total exported lime crop of the colony estimated in barrels of limes amounted to approximately 45,000 barrels valued at £21,582, as compared with 44,019 barrels valued at £19,682 in 1933. This apparent increase is to some extent due to a carry-over of lime-oil from 1933 being exported in 1934. There is however a moderate increase in the total crop for the Colony as compared with that of the previous year.

The occurrence of Red Root disease was observed originally in the principal lime area of the Colony, and subsequently was found to occur more or less generally in all lime orchards, where the pathogenic fungus is capable of causing the destruction of the root system of the older seedling trees.

Attention was therefore directed to re-establishment by planting resistant budded stocks. This work is proceeding steadily, and orders approaching 10,000 budded trees are now in hand for 1935.

The exports of concentrated juice decreased owing to low prices for this product, and amounted to 3,371 gallons as compared with 16,208 gallons as the year 1933. The market demand was poor and quotations remained at about £4 15 0 per pipe c.i.f. with an improvement towards the end of the year. A larger volume of trade was done in raw lime juice, 10,525 gallons valued at £471 being exported, and consisting mainly of specially manufactured juices with pulp for making cordials.

The production of distilled lime oil was again the principal feature of the crop, the quantity made being 13,406½lb. valued at £12,275; a considerable excess on that for the previous year—8,056 lb valued at £7,412. The market prices were erratic, from 20/- to 27/- per lb. c.i.f.

Handpressed oil was less in demand and a smaller quantity was exported, 1,251½ lb. valued at £1,868: 1933—2,582 lb. valued at £3,021. Quotations ranged from 31/- to 37/- per lb. c.i.f.

Important developments were taking place at the end of the year for the improved marketing of these valuable products.

The green lime trade made an encouraging advance during 1934 particularly in the United States and Canada, 6,001 barrels of limes being exported, valued at £7,010, as compared with 3,658 barrels at £4,145 in the previous year.

The value of exported lime products is now approximately half that of the sugar exports. The lime industry is thus the second in rate of agricultural importance in the Colony.

The crops for the last ten years estimated in barrels of limes are tabulated below:—

Year.	Quantity. Barrels.
1925	63,406
1926	59,415
1927	58,948
1928	56,186
1929	34,483
1930	42,844
1931	50,339
1932	44,762
1933	44,019
1934	45,000

COCONUTS.

This crop has now assumed the position of third staple industry, largely through the increased value of nuts exported. The total quantity exported in 1934 was 2,616,175 nuts valued at £7,298, as against 1,199,808 nuts valued at £3,527 in 1933. This trade was mainly with Canada.

There is an increasing appreciation of the excellent quality of nut produced locally which should lead to further expansion.

The copra trade was concurrently less active, quotations being low throughout the year generally, from £9 per ton c.i.f., an improvement to £10 being evidenced in December. Copra exports therefore decreased to 302 tons valued at £2,592.

The following are the quantities of nuts and destinations to which nuts were exported during the year:—

	Number.
United Kingdom ...	498,403
Canada	1,400,014
U.S. America	43,380
Bermuda	33,592
Barbados	270,590
Montserrat	196

The following figures show the quantity and value of exports of coconuts and coconut products during the last ten years:—

	Coconuts No.	Value £	Copra tons.	Value £	Total Value. £
1925	123,516	432	100	3,563	3,995
1926	118,501	380	80	1,808	2,188
1927	96,813	351	200	4,409	4,760
1928	141,667	444	315	8,690	9,134
1929	295,983	1,032	359	9,878	10,910
1930	268,078	862	400	7,428	8,290
1931	367,350	1,178	498	5,869	7,047
1932	650,240	2,430	432	5,389	7,819
1933	1,199,808	3,527	542	5,167	8,694
1934	2,616,175	7,298	302	2,592	9,890

CACAO.

The cacao market remained depressed generally throughout the year, and a reduction in area further accounts for the continued restriction and loss of importance of this once valuable crop. Exports augmented slightly —6,349 cwt. valued at £6,032, being consigned mainly to Canada, the United Kingdom and Trinidad. The interest shewn by the Canadian market has been a great encouragement to the depressed producers, and better prices are now being realised in this market. A warmer reception is thus indicated with regard to proposals to classify the local grades to accepted standards in order to retain and improve this market. Quotations ranged from 20/- to 30/- per cwt. c.i.f., the Canadian price being approximately 26/- c.i f.

Destinations of exported cacao during 1934:—

	Cwt.	£
United Kingdom	1,004½	1,208
Canada	3,761¼	3,679
Barbados	465	229
Trinidad	1,112	911
St. Kitts	2¼	2
Anguilla	4	3

Cacao exports—5 year period 1930—1934:—

	Cwt.	*Value £*
1930	10,449	19,261
1931	10,419	14,125
1932	8,188	9,091
1933	6,056	6,778
1934	6,349	6,032

Trinidad Cacao Seedling Selections.

Two consignments of cacao pods selected by the Cacao Research Officers were received and germinated during the year. From the seeds 252 plants were raised, and a number of these have been selected and put out on estates under the following conditions:—

Estate.	Selection.	Altitude	Conditions.
"L"	48 plants = (8 strains) ...	1,000′ ...	Rainfall—100″ per annum. Cool—wet climate.
"U.V."	24 „ = (4 strains) ...	600′ ...	Rainfall—85″ per annum. Warm—drier climate.
"F.D."	12 „	900′ ...	Rainfall—90″ per annum. Cool—moist climate.
"R"	12 „ = (6 strains) ...	800′ ...	Rainfall—90″ per annum. Cool—moist climate.
"S"	12 „	Sea-level ...	Rainfall—90″ per annum. Hot—moist climate.

A further complete selection is to be established at 800′ on land owned by the Department, for purposes of observation and propagation.

THE BANANA TRADE.

At a meeting of the Agricultural and Commercial Society held in March 1934, an offer from the Canadian Banana Company to purchase all suitable Gros Michel bananas grown in the Colony, was considered and recommended. A committee was selected for the purpose of promoting the negotiations and to consider the necessary legislation.

The provisional Committee was officially appointed with the Agricultural Superintendent as temporary Chairman, and the Marketing Officer (Mr. A. C. Shill) as Secretary-Treasurer, with six members representative of the planting and shipping interests, to deal with immediate shipments and the formation of the St. Lucia Banana Association. This organisation prepared the draft legislation subsequently enacted as Ordinance No. 1 of 1934, and a contract for a period of five years (3rd April 1934—1939) was then entered into by the newly constituted Board with the Canadian Banana Company Limited, on behalf of the Association.

The following members of the Board of Management of the Association were elected for the ensuing year:—

Official nominees.	Hon. Gregor McG. Peter (Chairman).	
	R. S. Haughton, Esq.	
	H. Devaux.	,,
	E. A. Walters,	,, Agricultural Superintendent.
Elected members.	A. E. Augustin	,,
	F. Barnard	,,
	C. A. Beaubrun	,,
	A. duBoulay	,,
	W. B. Harris	,,
	J. L. Royer	,,
	A. F. Nichols	,, Assistant Superintendent (temporary Honorary Secretary)

Mr. R. Belmar was subsequently appointed by the Board as Secretary-Treasurer to the Association. The office of the Association was installed at Departmental headquarters.

The banana industry was therefore placed in a strong position by the acceptance of the 5-year contract with the Canadian Banana Company, whereby all Gros Michel bananas of accepted quality are exported at the rate of 50 cents per count bunch sold to the local Banana Association. A campaign of banana extension has been vigorously pursued, including the provision of disease-free plants, inspection and treatment of diseased areas, and improvement in grade and quality. This has resulted in a rapid increase of banana planting, conducted mainly in new forest land, and an estimate of appoximately 50,000 bunches has been made for the new crop 1935. Extensive new areas for bananas have been located, and it is hoped that the provision of funds will be possible in order to extend the motorable roads through selected forest lands. The programme further provides for a self-supporting land settlement scheme.

In order to minimise the risk of introducing Panama disease and root-boring pests into the new forest lands now being taken up, three banana nurseries were started by the Department early in the year. These nurseries have done well, and as far as can be assured the plants issued therefrom are free from disease and pests.

Barre de L'Isle Nursery :	6 acres	— 6,200	plants.
Mahaut	,, 2	,, —2,300	,,
Quilesse	,, 4	,, —4,000	,,

The cost of cultivation for the year including the felling and clearing of forest and the purchase of plants was from £10 to £12 per acre.

The majority of the stools were ready for use early in 1935 and on being sectioned yield from 4 to 12 plants each.

The estimate of plantings 1934 in the various districts is given below:—

Micoud	... ...	60,000 plants.
Dennery	... ...	34,000 ,,
Castries	... ...	15,000 ,,
Gros Islet	... ...	7,000 ,,
Anse-la-Raye	... ...	24,000 ,,
Canaries	... ...	26,000 ,,
Laborie	... ...	20,000 ,,
Soufrière	... ...	20,000 ,,
Choiseul	... ...	5,000 ,,
	Total ...	211,000 plants.

The Agricultural Officer, Mr. G. M. Glasgow was away on duty-leave in Jamaica, from the 25th April to 19th June, and made a study of the methods of cultivation and handling bananas, through the facilities generously offered by the Canadian Banana Company and others. The information gained has been incorporated with other material in a handbook on Banana Cultivation now in the press.

THE POSITION OF THE GRAPEFRUIT INDUSTRY.

The pesent total area in Grapefruit is approximately 250 acres. Of this, 220 acres are new 'Marsh' planted since 1928 and now only in light bearing. The exports from this area during 1934 amounted to 32 crates only (£13), the bulk of the fruit being disposed of as stores to ships of the Fleet; the remainder being subject to a high rejection rate on account of inferior fruit from earlier planting and from marking defects. A firm stand in this connection has had to be taken to prevent discrimination against St. Lucia fruit.

Where the new trees have come into steady bearing, the fruit has been definitely satisfactory, and it now remains for planters to adopt this crop much more freely in the suitable estates. At elevations above 500 feet, and rainfall from 80 to 90 inches per annum, the quality and appearance of the fruit is much improved, and the need for spraying is less urgent.

Costs.

The costs of cultivation taken from Union Station demonstration plots can be put at from £10 to £15 per acre per annum according to type of land and general management. The crop on full-bearing trees can be estimated at from three boxes per tree, and the net return per citrus crate from St. Lucia Government Marketing Depot operations, may be put at 3/10 per crate. The return per acre is therefore as follows:—

Crop at three cases per tree at 50 trees per acre—150 cases.		
150 cases at 3/10	...	£28 15 0
Cost of cultivation	...	15 0 0
Return per acre per annum	...	£13 15 0

Trinidad costs for comparison.

Average net returns to Grower per crate "Standard"—4/-		
150 cases per acre per annum at 4/-	...	£30 0 0
Cost of Cultivation	...	12 18 4
Return per acre per annum	...	£17 1 8

The state of the Grapefruit market is regarded as very satisfactory in view of the Preference of 2/6 per case, and the increasing consumption of Empire Fruit, as shewn in the following schedule from the Empire marketing Board statistics.

Imports of Grapefruit—United Kingdom, 1928—1934 (in thousand cwt.).

	1928.	*1929.*	*1930.*	*1931.*	*1932.*	*1933.*	*1934.*
Total Empire Countries	55	75	90	138	224	337	...
Total Foreign Countries	418	468	467	758	549	442	...
Total	473	543	557	896	773	779	974
Empire Produce per cent. of total Imports	11	14	16	16	30	43	...

The unfavourable aspect of Grapefruit marketing at present is the lack of shipping facilities, particularly cold storage space, and high freight rates. This matter is being taken up officially.

On all other counts, this crop is deserving of favourable consideration as a main crop. It is therefore the more to be regretted that a surplus of excellent plants produced during the year had to be converted to other uses.

Other Fruits.

There was also some improvement in the mango export trade, and experimental shipments in cold storage were made to London. These gave a satisfactory return and are reported in more detail under PACKING HOUSE OPERATIONS.

The following comparative schedule gives the Fresh Fruit exports and values for the five year period 1930—1934.

		1930.		1931.		1932.	
		Amount.	Value £	Amount.	Value £	Amount.	Value £
Green Limes	barrels ...	2,308	3,218	4,114	5,418	3,782	5,552
Grapefruit	crates ...	246	65	102	36	108	43
Oranges	,, ...	...	223	367	169	598	206
Mangoes	,, ...	...	915	9,823	2,172	7,754	1,655
Avocado Pears	,, ...	1,628	366	2,924	567	4,768	977
Pineapples	,, ...	49	18	67	23	206	96
Bananas	bunches ...	4,568	219	5,364	274	3,149	185
Miscellaneous	...	...	1,613	...	1,492	...	1,463
		...	6,637	...	10,151	...	10,177

		1933						
		Amount.						
		To Canada.	To Bermuda.	To U.K.	To U.S.A.	To other places.	Total.	Value £
Green Limes	barrels ...	77	681	64	2,928	8	3,758	4,445
Grapefruit	crates ...	...	27	...	...	1	28	13
Oranges	,, ...	...	242	...	...	261	503	141
Mangoes	,, ...	473	4,567	5	...	2,445	7,490	1,212
Avocado Pears	,, ...	...	3,111	...	...	33	3,144	610
Pineapples	,, ...	17	89	...	...	...	106	31
Bananas	bunches ...	16,273	...	3,629	270	2,086	22,258	1,626
Miscellaneous	... ...	...	...	...	...	...	...	2,003
Total	... ...	...	...	...	...	...	...	10,081

1934

		Amount.						Value £
		To Canada.	To Bermuda.	To U.K.	To U.S.A.	To other places.	Total.	
Green Limes	barrels ...	261	727	55	4,947	11	6,001	7,010
Grapefruit	crates ...	13	19	...	...	...	32	13
Oranges	,, ...	1	160	1	2	210	374	92
Mangoes	,, ...	288	3,535	298	...	3,760	7,881	1,372
Avocado Pears	,, ...	4	2,241	...	...	...	2,245	389
Pineapples	,, ...	...	36	...	...	...	36	16
Bananas	bunches ...	17,136	...	713	...	528	18,377	1,499
Miscellaneous	... ...	...	...	...	...	...	...	1,917
Total	... ...	...	...	...	...	...	...	12,308

GOVERNMENT MARKETING DEPOT, INSPECTION, AND PACKING HOUSE OPERATIONS.

A total of 11,872 packages of fruit and 17,849 bunches of bananas, was inspected for export by the Fruit Inspectors under the Fruit Ordinance.

The Depot was used particularly for limes and mangoes to Canada and Bermuda, and limes to the United States of America. (=2,246 crates of fruit).

The Packing Shed provided from Imperial Funds has been used more extensively this year than in the past.

Shipments to Canada by the Depot on behalf of producers gave average net returns after deducting packing, freight and selling charges, as follows :—

Fruit.	*Net return per package.*	*Package.*	*Quantity Crates.*
Limes	4/-	Lug 0·6 cubic ft. 24 lb. net.	144
Julie Mangoes	4/8	,, 25—35 fruits	8
Grapefruit	3/10	Citrus 2 cubic ft.	11
,,	1/6	Half-citrus 1 cubic ft.	2

Statement of Shipping Transactions of Government Marketing Depot for the year ending 31st December, 1934.

	£	s.	d.		£	s.	d.
Cost of packing (materials, labour, inspection fees, cold storage dues)	11	14	8½	Receipts from abroad ...	53	11	4½
Freight and stamps	4	14	4				
Export duty (on limes)	1	15	0				
Commission	1	7	2				
Payments to producers	34	0	2				
	£53	11	4½		£53	11	4½

The Depot shipped only a small quantity of limes to Canada as the present limited Canadian market was kept well-supplied. Average net returns at the Depot about 26/- per barrel (=6½ lugs), compared very favourably with prices at the time on the New York market. The green lime trade between St. Lucia and Canada showed improvement. 77 barrels in 1933. 261 brls —1934. A small shipment of Marsh and Duncan grapefruit was made early in the year to Canada, being reported on very favourably. The market was weak at the time, giving a net return of 3/10 per citrus crate.

Shipment of Mangoes from St. Lucia.

1. *Julie Mangoes from the Depot to Canada during 1933.*

Number of Crates.	*Where Sold.*	*Gross selling price per Crate.*	*Net per Crate to grower.*
6	Montreal	$1·52	·65c.
26	Toronto	$2·01	·86c.
36	,,	$2·19	$1·12c.
52	,,	$1·19	·18c.
120		Average $1·69	Average $0·63c.

2. *Julie Mangoes from the Depot to Canada during 1934.*

Early in the season eight crates of Julie mangoes were sold in Toronto at $2.25 per crate, and the very attractive net return of $1.14 per crate of about 30 fruits was obtained. Another trial shipment of 73 crates to Canada in August proved a failure, as some of the fruit was said to have arrived in an over-ripe condition, and the market had been damaged by wild, stringy fruit that had been shipped from other sources.

This shipment was reported on by the brokers as being the best for quality ever received from the West Indies. Unfortunately, however, 10—12 per cent. was over-ripe, arriving in a soft condition, and appeared to have suffered from storage at 51°F.

3. *Trial Shipments of Julie Mangoes to England in 1934.*

	1st Shipment. 19th June, 1934, 72 crates.	*2nd Shipment. 19th July, 1934, 95 crates.*
	£ s. d.	£ s. d.
Freight	4 19 1	6 10 8
Packing, handling, cable, etc.	5 4 1	6 9 7
G.M.D. Commission (2½%)	12 0	15 6
	£10 15 2 (a)	£13 15 9 (b)
Cost of Fruit	4 19 0	8 13 4
Total Cost	£15 14 2	£22 9 1
Cash received	24 4 1½	31 7 7
Net proceeds	£8 9 11½	£8 18 11

C.i.f. cost exclusive of value of fruit (a) £10 15 2
(b) 13 15 9
£24 10 11

Gross selling prices in London, from 3/8 to 12/- per case.
Average selling price approximately 8/- ,, ,,
C.i.f. cost per crate (167 lugs) 3/- ,, ,,
Selling & handling costs London (£7 17 1) 1/- ,, ,,
Net returns to grower at packing shed 0/1·3 per fruit, or 3/9 per case.

Wastage

Number of fruit shipped ... 5,160

Wastage.	*per cent.*
1st shipment	22
2nd ,, ...	5
both shipments	13

N.B.—Condition of fruit on arrival in England was said to be satisfactory although a good deal of spotting appeared on the fruit during storage. The fruit compared favourably with that from other sources.

Method of Packing Julie Mangoes during 1933—1934.

The 20lb. tomato lug only has been used. The counts per lug are 25,

30, 35, and 40. (30's and 35's being the most common counts). The fruit is wrapped in pink sulphite tissue paper and packed in two layers in each case with the flat side of the fruit parallel to the top and bottom of the case. A small pad of wood-wool is used to protect fruit from rubbing against the sides of the cases. Julie mangoes are shipped at about 45°F.

No shipments of common mangoes have been made by the Depot, but common mangoes shipped from St. Lucia to Bermuda are mostly packed in full-citrus crates with counts varying from about 120 to 180 per crate, and shipped in ordinary storage.

With freight rates and costs of packing materials, etc., remaining unchanged, the minimum selling price of Julie mangoes in London, remunerative to St. Lucia growers, would be about 6/- to 6/6 per crate.

Government Packing Shed.

A considerable quantity of fruit, particularly limes and mangoes shipped to Canada, and general Bermuda shipments, was packed by the Depot for private exporters. The packing shed was also used regularly by several persons for packing fruit under supervision for export to Bermuda.

The Packing House Fees collected during the year amounted to £6 3 1.

The sum of £2 5 0 was also collected as rental fees for space used by exporters, principally for the Bermuda trade, in the Auxiliary Packing Shed.

Stock Account.

This revolving account is operated in order to purchase packing materials co-operatively for exporters. The maximum authorised expenditure is £350.

The Balance Sheet for this account for the year ending 31st December, 1934, is entered below and shows a gross profit of £84 3 2 which is credited to General Revenue. The Account does not include cost of supervision and general depreciation, which is provided for under the Grant to the Depot.

Dr. Particulars.	Amount £ s. d.	*Cr.* Particulars.	Amount £ s. d.
Balance debited to a/c at 1.1.34	139 17 1	Sales	384 9 0
Outstanding a/cs	43 12 1	Outstanding a/cs (at 31.12.34)	33 2 5
Purchases during 1934 ...	287 1 1	Shortages and breakages ...	1 0 6
Import duty (to be transferred)	13 17 11	Writing down of 381 pine-apple crates	6 7 0
Surplus at stock-taking ...	1 2 9	Stock on hand	144 15 2
Balance (credit)	84 3 2		
	£569 14 1		£569 14 1

Inspection.

All fruit exported to countries outside the West Indies, with the exception of limes to the United States, was inspected. The Inspection Fees collected during the year amounted to £48 16 4. (1932, £47 14 0; 1933, £47 12 0.)

WORK OF THE MARKETING OFFICER FOR THE LEEWARD AND WINDWARD ISLANDS.

Mr. A. C. Shill, M.Sc., A.R.C.S., D.I.C., A.I.C., was temporarily transferred to the Advisory Department, Imperial College of Tropical Agriculture, on June 12th, 1934, and in December, 1934, was promoted to the office of Agricultural Adviser and Controller of Exports, Malta.

The benefits derived from the co-operation and assistance of this popular officer have had a great influence on the successful development of the fruit trade, and his departure is regretted.

COLD STORAGE AND ICE MAKING FACTORY.

The Cold Storage has been freely used for precooling of exports, and for local cold storage, a total revenue of £181 7 5 being derivable from the year's working. The Ice Factory manufactured 116¾ tons of ice and sold ice to the value of £258 0 11½ during the year.

EXPORTS FROM ST. LUCIA, 1933 AND 1934.

		1933.			1934.		
		Quantities.	Value. £	£	Quantities.	Value. £	£
SUGAR PRODUCTS:—							
Sugar, Vacuum Pan	tons ...	4,940	46,493		4,730	39,396	
Molasses & Syrup	gall. ...	43,260	1,417	47,910	23,080	1,431	40,827
CACAO PRODUCTS:—							
Cacao	cwt. ...	6,056	6,778	6,778	6,349	6,032	6,032
LIME PRODUCTS:—							
Concentrated Lime Juice	gall. ...	16,208	860		3,371	228	
Raw Lime Juice	,, ...	591	40		10,525	471	
Distilled Lime Oil	lb. ...	8,056	7,412		13,406	12,275	
Essential H.P. Otto of Limes	,, ...	2,582	3,021		1,251	1,868	
Green Limes	brl. ...	3,758	4,445	15,778	6,001	7,010	21,852
COCONUT PRODUCTS:—							
Coconuts	No. ...	1,199,808	3,527		2,616,175	7,298	
Copra	tons ...	542	5,167	8,694	302	2,592	9,890
HONEY PRODUCTS:—							
Honey	lb. ...	34,826	373		43,051	424	
Beeswax	,, ...	206	5	378	168	10	434
BAY PRODUCTS:—							
Bay Oil	gall. ...	20	32		2	8	
Bay Rum	,, ...	1,827	398	430	1,424	301	309
SPICES:—							
Nutmegs	lb. ...	6,834	80		8,272	102	
Mace	,, ...	1,326	58		1,062	51	
Kola Nuts	,, ...	13,760	108		15,688	121	
Miscellaneous	,, ...	2,347	22	268	35	2	276
Carried forward	...			80,236			79,620

EXPORTS FROM ST. LUCIA—(*continued*).

		1933.			1934.		
		Quantities.	Value. £	£	Quantities.	Value. £	£
Brought forward	...	...		80,236	...		79,620
VEGETABLE PRODUCTS:—							
Plantains	bchs.	341	22		208	14	
Farine	lb. ...	12,530	61		22,202	113	
Yams	,, ...	...	25		...	7	
Miscellaneous	,, ...	...	214	322	...	105	239
FRESH FRUITS & PRODUCTS:—							
Bananas	bchs.	22,258	1,626		18,377	1,499	
Mangoes	crates...	7,490	1,212		7,881	1,372	
Oranges	,, ...	503	141		374	92	
Grapefruit	,, ...	28	13		32	13	
Pineapples	,, ...	106	31		36	16	
Avocado Pears	,, ...	3,144	610		2,245	389	
Mixed Fruits	...	...	2,003		...	1,917	
Preserved Fruits.	...	...	117		...	38	
Jams, Jellies, &c.	...	...	43		...	47	
Miscellaneous	...	...	...	5,796	...	3	5,386
FOREST PRODUCTS: —							
Boards (native)	c. ft. ...	1,871	151		2,008	158	
Cedar	,,	...	...		103	8	
Firewood	cords ...	793	290		618	196	
Logwood	tons ...	10	25		67	98	
Hardwood	c. ft. ...	3,116	248		4,008	242	
Brooms	doz. ...	952	35		1,052	35	
Charcoal	bags ...	85,840	4,327		89,238	4,486	
Furniture (Household)	...	...	333	5,409	...	147	5,370
LIVE STOCK & PRODUCTS:—							
Cattle	No. ...	...	...		...	...	
Hides & Skins	,, ...	2,240	122		1,391	97	
Shells, Turtle	lb. ...	105	22		...	141	
Horses	No. ...	63	288		85	369	
Mules	,, ...	23	126		22	134	
Asses	,, ...	5	11	569	2	6	747
MISCELLANEOUS PRODUCTS	...		275	275		317	317
Total Exports	...			£92,607			£91,679

AGRICULTURAL OUTLOOK.

The total export value of the products of agriculture and related industries amounted to £91,679 as compared with £92,607 in the previous year, a decrease of relatively small moment. The difference in value of sugar exports accounted for a reduction of £7,000, this however being compensated for by the rise in value of Lime Products (approx. £6,000) and of Coconut products (approx. £1,000) in order of importance. The Cacao industry remains at a standstill, and the re-introduction of a Banana industry has not yet had time to influence the prosperity of the Colony, though there are satisfactory indications of this for the new year. This crop and that of the orchard fruit industry, is likely to influence the welfare of small-holders and peasants to an increasing degree during the next decade, and an investment in land promises to be the means of livelihood to a greater part of the population than heretofore. This should enhance the spirit of true independence arising from self-support.

The favourable prospects of the Grapefruit industry should attract the attention of the middle-class planters and larger estate owners mainly, in view of the technical knowledge and care required, but the capital investment required is within the means of the majority of the planters.

PEASANTS' DEVELOPMENT.

Frequent meetings were held by Agricultural Officers on holdings and in the villages in order to demonstrate the influence of proper methods of cultivation of the Citrus and Banana crops. The small-holders have appreciated these efforts, and closer co-operation is being maintained generally with those about to take up new land or crops.

The progress of the Mango topworking scheme continues and approximately 5,000 Julie mangoes will be coming into fruit during the next two years. The marketing end of the crop has been attended to and there is a prospect of remunerative shipments to the United Kingdom, and some to Canada and elsewhere, as the crop expands.

AGRICULTURAL INSTRUCTIONS IN THE PRIMARY SCHOOLS.

REPORT OF THE AGRICULTURAL SUPERINTENDENT ON THE TEACHING OF AGRICULTURE IN THE PRIMARY SCHOOLS OF ST. LUCIA DURING 1934.

The twenty-sixth annual examination of the pupils of the Primary Schools in Agriculture was conducted by the Agricultural Instructor during the period November 15th to December 7th, and his report on theory and garden practice is appended.

In general the results are disappointing as compared with earlier years, and with the exception of the theoretical branch, cannot be regarded as commensurate with the time and labour expended in giving instructions. Too much 'priming' in order to pass in book subjects has led to neglect of open-air activities in the gardens and the general standard has consequently fallen off to a marked degree.

It is therefore considered sufficiently serious in view of the active agricultural policy of the Colony, to warrant the re-introduction of the General Lectures to Teachers given annually, but abandoned since 1928 for reasons of economy. This lapse has led to a loss of interest on the part of teachers particularly in the more remote districts, to whom the annual lectures over five days were a source of inspiration and enthusiasm, the fresh personal contacts and new avenues of thought so provided being a means of stimulating the entire garden classes to active competition and progress.

An examination of the answers given by probationary teachers endeavouring to obtain their certificates reveals that they are less informed on general practice and theory than the pupils in their garden classes. Consequently the present growing generation is receiving only desultory teaching and is the less likely to develop into an agriculturally minded population with a bias for estate employment or small holdings independence.

This would be very unfortunate in view of the improvement in agricultural prospects and the dire need for an increased *country* population.

In addition to stabilising and enlarging the teaching programme so that in future all the travelling officers would take part in school agriculture, the re-introduction of annual lectures would make for a more receptive staff of School-Teacher garden instructors, adequately informed and stimulated by object lessons such as visits to selected plantations,

nurseries, to the Experiment Station and Stock-farms, and to other centres of agricultural industry suitable for demonstrative purposes.

The Instructor's report shows that little success has attended the efforts to obtain land for gardens where the present sites are poor or non-existent, a strange commentary in a country where land is cheap and plentiful, but nevertheless likely to continue so until special efforts are made to see that their reasonable needs be met, either by gifts or nominal rental of land. For instance, one Castries boys' class containing 145 boys, the largest class in the Colony, conducts gardening in boxes in the School garden, and elsewhere in Castries, Micoud, Soufriere and Saltibus, insignificant patches of land render any practical efforts of little value.

Further, garden tools are generally in a broken and worn-out condition if provided at all, in several cases these being only condemned articles from the annual tool survey supplied by the Department. Such conditions prevent any adequate response to the teaching given.

It was hoped that the Agricultural examination could have been carried out during the general School examination but this was impossible owing to Departmental activities in land survey and banana extensions, and the later examinations was thus unsatisfactory owing to a large list of absentee pupils. Of the total number of 734 pupils taught agriculture, only 61.9 per cent. (454) sat for the examination. Of this number 18.9 per cent. or 86 pupils from ten schools were girls who acquitted themselves very satisfactorily.

In the present year 1935, examination work will be alleviated by marking the practical work and demonstrations each quarter for the final report; more attention to the garden note-book will also be required to satisfy the Instructor that consistent work is being done, apart from any special presentation at examination time. Such note keeping has been already explained from examples on the blackboard.

Finally, attention is directed to garden sanitation, and the upkeep of hedges, drains, etc. where a general improvement is needed.

The number of plants grown and issued from the School-gardens is lower than usual and is given below for purposes of record:

School.	Mangoes top-worked.	Mangoes grafted.	Oranges budded.	Grapefruit budded.	Limes budded.	Robusta Coffee.	Pineapples	Totals.
Castries Anglican	...	...	...	...	...	...	...	...
Castries Methodist	...	...	...	...	...	...	...	...
Castries R.C.	...	...	...	...	...	...	...	...
La Ressource R.C.	...	3	10	16	...	...	...	29
Micoud R.C.	...	...	...	...	...	...	...	...
Vieux-Fort R.C.	...	...	...	1	11	...	...	12
Laborie R.C.	...	...	...	6	...	...	...	6
Dennery R.C.	...	...	8	48	40	13	...	109
Choiseul R.C.	...	...	...	9	3	...	...	12
Anse-la-Raye R.C.	...	...	...	19	7	...	...	26
Mon Repos R.C.	...	2	4	3	...	...	...	9
Forestiere Methodist	...	...	...	...	...	...	...	...
Soufrière R.C.	...	...	...	...	...	...	...	...
Babonneau R.C.	...	2	4	16	7	...	64	30	123
Riviere Dorée Anglican	...	...	...	...	...	...	...	...	...
Canaries Juvenile	...	...	...	...	...	...	...	...	...
Saltibus R.C.	...	...	...	...	...	...	...	...	...
	7	26	118	68	13	64	30	326

Of the twelve candidates presented for the Certificate examination, seven obtained above 50 per cent. of marks, and passed in both practical and written branches, two others obtained only about 50 per cent. failing mainly in the practical work, while the remaining three failed in both branches of the examination.

EXAMINER'S REPORT.

Canaries R.C. Boys' Juvenile.

The theoretical work has shewn improvement, but the practical work and condition of the garden is still unsatisfactory and the work done is not interesting. The garden was cropped merely with cow peas and red beans at random, the beds not being specially laid out. A plan for remodelling and cropping during the coming year, has been drawn up and discussed on the spot, and if this is followed should ensure better results.

Anse-la-Raye R.C. Juvenile.

The theoretical work was satisfactory but the garden requires a thorough overhauling and better sanitation. The practical work should be arranged so as to interest the class and not specially calculated to show well for examination day. When crops are reaped the beds should be thoroughly tilled and remodelled, drains and paths improved and the hedges strengthened instead of reintroducing a further crop for show.

Micoud R.C. Juvenile.

The theoretical work was satisfactory. The garden has been extended in the same area and although the soil is sandy and not suitable for a school-garden, improvement has been shewn in the general handling. The beds were cropped with cabbage, egg-fruit, tomato and other vegetables, giving very good results. Large quantities of humus should constantly be buried in the soil, and the beds should be heavily mulched before the dry season sets in.

Mon Repos R.C. Juvenile.

The theoretical knowledge is fair and both the practical work and condition of the garden have shewn improvement the pupils also being more interested in the agricultural work. The crops were well selected, and planting and after-care of Gros Michel bananas formed part of the practical work, and there was sufficient material to give useful lessons to the class. Thorough tillage, heavy manuring and early mulching must not be neglected at this School.

Dennery R.C. Boys'.

The theoretical knowledge was good, but the practical work and condition of the garden was disappointing after the high standard this school had attained. The plot of *Gros Michel* existing illustrated all that should *not* be done to grow good bananas. Instead of drifting, the garden generally should be remodelled and the practical work be taken in hand. The improvements necessary have been discussed on the spot.

Forestiere Methodist.

The class at this School was small but the theoretical knowledge was satisfactory. The practical work and condition of the garden showed improvement. The crops consisted of beds of garlic, onions, ginger, chives, cabbage and other vegetables such as are well suited to the district. The vanilla cultivation should be extended, and each pupil encouraged to grow vanilla at home. Attention should also be given to the cultivation of *Coffea robusta* instead of the Liberian species.

La Ressource R.C.

The theoretical knowledge was satisfactory, and considering the heavy nature of the soil, the condition of the garden and the practical work showed intelligent handling. The wind-breaks are very important and require more care. Good results in this garden depend on the effectiveness of the windbreaks, heavy manuring and mulching, plus good drainage. As Scab disease of sour orange is prevalent, all diseased citrus plants should be rooted up and burned, and a limited number only of sour orange stocks be grown in future for practice in budding.

Babonneau R.C. Juvenile.

The practical work here has fallen off, and the tendency is to reduce the area of the garden to a few small beds. Advantage should be taken of the full area available, and plots of yams, coffee, cabbage, tomatoes, beans, and other vegetables cultivated as object lessons to the district. More attention should be given to the *Glyricidia* windbreaks, pen manuring, and heavy mulching. Beds should be mulched and allowed to fallow, or be green-dressed, instead of attempting to cover entire beds with a few plants at absurd distances apart. The theoretical knowledge was satisfactory.

Vieux-Fort R.C. Boys.

Marked improvement has been shewn in the work and care of this garden. It has been thoroughly fenced in with wattles and provided with a gate, making it fairly secure from fowls

and thieves. The garden was cropped with beds of cabbage, tomatoes, red beans and other vegetables, giving very good results. Drainage is difficult but this can be remedied by raising the beds. Heavy manuring and mulching is necessary and the latter can be provided by growing lemon grass along the border of the garden instead of the Panax hedge. The theoretical knowledge was good.

Castries Methodist Juvenile.

The theoretical knowledge was very satisfactory. Proper use was made of the small garden, and the practical work included the cultivation of a few plants of yams, eddoes, and bananas, and sour-orange stocks for budding, and cabbage, eschalot, lettuce, onions and other vegetables made a really good show in boxes. The pupils were very much interested in the demonstrations.

Castries Anglican Juvenile.

The theoretical knowledge was very satisfactory. The practical demonstrations were carried out efficiently and fully illustrated the class lessons, but the condition of the garden has fallen off, and the soil is showing signs of poverty. The beds are laid out correctly across the slopes, but the drains are too shallow. The garden requires a liberal application of pen manure.

Castries R.C. Boys'.

The theoretical knowledge was very satisfactory. A good deal of practical work was attempted in the small garden, but care must be taken not to overcrowd with large and heavy plants e.g. bananas, of which there is room for only one stool. The box gardening was quite a success and produced good crops of cabbage, lettuce and onions. This school has the largest agricultural class in the Colony, and a substantially large piece of land is necessary for the serious practical work that should be done here.

Choiseul R.C. Boys'.

The theoretical knowledge was satisfactory, and the practical work has shewn improvement. Good crops of beans, yams, onions, eschalot, papaws and other vegetables have been raised. The soil of the garden is poor and requires large quantities of pen manure, and heavy mulching. Defective sour-orange stocks should be dug up and burned and new stocks raised for budding purposes.

Laborie R.C. Boys'.

The theoretical knowledge was good, and the practical work was well arranged and carried out, good crops of onions, cabbage, beans, yams, tomatoes and other vegetables being grown. The soil is becoming exhausted and requires liberal applications of pen manure, and heavy mulching before the dry weather sets in.

Soufriere R.C. Boys'.

The theoretical knowledge was satisfactory. The soil of this garden is poor but better use can be made of it by digging in large quantities of pen manure, and by judicious mulching and deeper tillage. Water is available and good crops of cabbage, lettuce, tomatoes, onions, beans and other vegetables should be grown. Annual plants should not be allowed to stand indefinitely in the garden after the main crop has been reaped, merely to obtain a few late fruits, and attention should be given to reforming and improving the beds.

Saltibus R.C. Juvenile.

The theoretical knowledge was fair. A suitable piece of land has not yet been obtained for a garden, and no practical work has been done during the year. The Schoolmaster reports an effort to rent a garden, but no funds can be obtained to pay for this.

Riviere Doree Anglican Juvenile.

Owing to change of Headmaster at this School, the garden is in charge of a Pupil Teacher.

The theoretical work was fair, and a good deal of practical work has been done, but the arrangement was defective.

The practical work is carried out near by in the Rectory yard, but the old school garden is a good one and should not be abandoned.

List of Marks and Standing of Schools in Agricultural Teaching.

Schools.	No. absent on Examination Day.	No. of Pupils Examined.	Condition and use made of Garden.	Practical work and Knowledge.	Theoretical Knowledge.	Total.	Percentage.	Result Not.
Possible Marks ...	—	—	10	10	10	30	100	—
Castries Methodist Juvenile ...	13	27	8	9	10	27	90	E.
Castries R.C. Boys' Juvenile ...	50	95	8	9	10	27	90	E.
Castries Anglican Juvenile ...	28(a)	55	8	9	10	27	90	E.
La Ressource R.C. Combined ...	17(b)	9	9	10	8	27	90	E.
Micoud R.C. Juvenile	9(c)	31	8	9	8	25	83·3	V.G.
Vieux-Fort R.C. Boys'	9	19	7	8	10	25	83·3	V.G.
Laborie R.C. Boys'	21	18	7	8	9	24	80	V.G.
Dennery R.C. Boys'	7	27	8	7	9	24	80	V.G.
Choiseul R.C. Boys'	23	15	8	8	8	24	80	V.G.
Anse-la-Raye R.C. Juvenile ...	12(d)	17	7	8	8	23	76·6	V.G.
Mon Repos R.C. Juvenile ...	8(e)	28	8	9	6	23	76·6	V.G.
Forestiere Methodist	1(f)	10	9	7	7	23	76·6	V.G.
Soufrière R.C. Boys'	25	52	6	7	9	22	73·3	G.
Babonneau R.C. Juvenile ...	17(g)	10	7	6	8	21	70	G.
Riviere Dorée Anglican Juvenile ...	2(h)	10	7	6	8	21	70	G.
Canaries R.C. Juvenile ...	28(i)	19	5	6	8	19	63·3	G.
Saltibus R.C.	10(j)	12	No marks awarded					
	280	454	7	7·4	8	22·4	74·8	

(a) including 17 girls; (b) 2 girls; (c) 15 girls; (d) 6 girls; (e) 18 girls; (f) 4 girls; (g) 4 girls; (h) 3 girls; (i) 7 girls; (j) 10 girls;

R. W. NILES,
Examiner.

ADMINISTRATION.

REPORT ON THE WORKING OF THE REUNION ESTATE AND LAND SETTLEMENT.

Land Settlement. Of the 46 lots comprising the Reunion Land Settlement, 44 have completed payments, making a total sum of £1,039 0 11.

Choiseul Village Extension. No more lots were taken up, and nineteen lots remain unsold.

The total revenue derived was as follows:—

	£	*s.*	*d.*
Instalments of Land Settlement	7	14	2
Instalments of Village Extension	2	18	0
House Lots and Land Rents		18	0
	£11	10	2

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

Three hundred and sixty-four Minute Papers and nine hundred and forty-seven letters were dealt with during the year; information was supplied and official returns rendered for the Blue Book, the Advisory Department and other Departments of the Imperial College of Tropical Agriculture, the Imperial Agricultural Bureaux, the Imperial Institute, the International Institute of Agriculture (Rome) and miscellaneous overseas enquiries.

Several reports and publications which were presented to the Library are gratefully acknowledged.

The following books have been recently added to the Reference Library—

"Textbook of Tropical Agriculture", by Sir H. A. A. Nicholls; "Some diseases of Farm Animals", by P. J. L. Kelland.

EXPENDITURE AND REVENUE.

Expenditure.

HEAD XVII.			
Personal Emoluments	£1,534	0	7
Travelling Allowance to Agricultural Superintendent	95	0	0
Travelling Allowance to Assistant Agricultural Superintendent ...	49	16	0
Travelling Allowance to Agricultural Instructor	113	6	8
Travelling Allowance to Agricultural Officer	52	13	4
Transport Allowance for visiting Officers, Imperial Department of Agriculture	14	4	1
Labour, Union and Castries Stations	399	2	3
Seeds, Plants and Manures	49	3	6
Transport and Animals	44	0	11
Miscellaneous Requisites	25	14	11
Printing, including Publicity Work and Purchase of Books ...	10	7	6
Minor Repairs to Buildings, Union and Castries	9	19	7
Freight and Transport of Plants	8	19	6
Contingencies	25	4	1
Demonstration Fruit and Vegetable Plot	41	19	4
Experimental Lime Plot at Union Station	75	3	6
Agricultural Cadets	139	8	5
Electric Lighting	5	8	4
	£2,693	12	6
HEAD XVIIA.			
Diversion of River Bed	12	0	0
HEAD XVIIB.			
Agricultural Society, Grant-in-Aid	20	0	0
HEAD XXII.			
3. (*a*) Government Fruit and Vegetable Depot—expended locally and with Crown Agents	197	4	2
(*b*) Peasants Development Service—expended locally and with Crown Agents	319	11	0
4.—Citrus Cultivation—expended locally and with Crown Agents...	523	15	0

Revenue.

HEAD	IV.	17.	Fees for Fruit Inspection	£48 16 5
		20.	Sales from Agricultural Stations	94 17 0
	X.	1.	Instalments, sales of lots	11 10 2
	XII.	4.	Sale of Citrus Plants	112 0 11
				£267 4 6

OFFICIAL VISITORS TO THE STATIONS.

His Excellency Sir Charles William Doorly, C.B.E., Kt.B., Acting Governor and Commander-in-Chief of the Windward Islands; Sir Geoffrey Evans C.I.E., M.A., Dip. Agric., Principal, (I.C.T.A.); Professor H. R. Briton-Jones, D.Sc., Ph.D., Dean, (I.C.T.A.); Mr. R. E. Baker, B.A., Lecturer in Mycology and Bacteriology, (I.C.T.A.); Captain H. V. M. Metivier, O.B.E., B.Sc., M.R.C.V.S., Lecturer in Veterinary Science, (I.C.T.A.); Mr. G. A. Jones, Dip. Agric. (Bangor), Commissioner of Agriculture, (I.C.T.A.); Mr. C. C. Skeete, B.A., Assistant Commissioner of Agriculture, (I.C.T.A.); Dr. P. J. Kelly, Medical Commissioner; Hon. G. V. Cameron, Attorney General, St. Lucia; Captain H. A. Foster, R.N., H.M.S. "Frobisher".

There was a large number of other visitors to the Stations during the year.

STAFF CHANGES.

Mr. G. A. Beaubrun, Chief Clerk and Accountant, continued to act as Revenue Officer and Keeper of the Spirit Warehouse throughout the year.

Miss A. Inglis, Clerk to the Agricultural Superintendent, took on the duties of Accountant from 8th September, 1934.

Mr. C. E. Charles, Acting Clerk, was on vacation leave from 2nd October to 16th November, 1934.

METEOROLOGICAL OBSERVATIONS.—APPENDIX I.

STATION, CASTRIES, St. LUCIA, B.W.I.

LONGITUDE =60° 59′ 49″ W. LATITUDE=14° 0′ 36″ N. HEIGHT ABOVE MEAN SEA LEVEL=10ft.

Month.	Air Temperature.				Absolute Max. and Min.				Relative Humidity (% Regnault's factor.)		
	7 a.m.	12 noon	5 p.m.	Mean	Max.	Date	Min.	Date.	7 a.m.	12 noon	5 p.m.
January ...	73·0	80·1	76·3	76·4	87	1st	68	26th	90	72	81
February ...	71·7	81·1	75·6	76·1	86	20th	67	20th	88	68	82
March ...	69·9	83·0	76·7	76·5	86	1st	64	4th	92	66	82
April ...	74·5	82·5	79·0	78·6	88	14th	69	1st	85	68	82
May ...	76·8	84·3	80·9	80·7	89	27th	68	4th	88	67	77
June ...	78·1	85·5	79·7	81·1	90	21st	70	5th	86	68	76
July ...	78·2	84·6	82·2	81·6	90	29th	72	3rd	89	74	77
August ...	78·2	85·2	81·3	81·5	90	18th	73	2nd	87	72	82
September ...	77·0	83·6	80·0	80·2	90	29th	72	30th	92	77	85
October ...	76·6	84·4	79·0	80·0	90	6th	72	1st	91	71	88
November ...	75·3	83·5	78·2	79·0	90	8th	72	6th	87	71	83
December ...	72·8	78·2	76·6	75·8	89	2nd	65	29th	92	81	85
Year ...	75·2	83·0	78·8	78·9	90	21st June	64	4th Mar.	89	71	82

APPENDIX II.

ht.=3′ 0″ *hr.*=1′ 10″. STATION CASTRIES.

Month.	Rainfall (inches)			Weather.		Wind. No. of Observations of. (at 7 a.m., 12 noon & 5 p.m.)								
	Total	Max.	Date	Days of Rain	Days of Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January ...	5·09	0·94	16th	24	0	6	—	71	—	3	—	5	—	8
February	2·45	0·56	1st	14	0	6	—	55	—	3	—	14	—	6
March ...	2·70	0·30	6th	16	0	2	—	82	—	1	—	1	—	7
April ...	1·53	0·37	23rd	12	0	6	6	52	3	6	2	8	2	5
May ...	2·76	0·39	18th	21	0	10	8	31	7	11	5	13	5	3
June ...	4·76	1·03	30th	20	0	14	3	44	4	8	3	10	2	2
July ...	6·01	1·75	4th	25	0	7	5	41	8	9	3	6	2	12
August ...	8·39	1·70	21st	28	0	8	2	58	6	3	1	9	1	5
September	9·93	1·96	6th	28	0	16	—	47	—	8	—	17	—	2
October ...	5·83	1·35	1st	26	0	5	—	65	—	12	1	7	—	3
November	7·26	2·24	30th	22	0	5	—	70	—	11	—	2	—	2
December	9·64	2·09	4th	27	0	7	—	69	—	7	—	8	—	2
Year ...	66·35	2·24	30th Nov.	263	0	92	24	685	28	82	15	100	12	57

ht.=Height of therm. above the ground in feet. hr. Height of the rainguage above the ground in feet.

METEOROLOGICAL CONDITIONS.

Rainfall: The total rainfall recorded at the Botanic Gardens, Castries, for the year 1934 was 66.35″ and is the lowest rainfall on record (45) years in contradistinction to that for the previous year which was the highest on record being approximately twice the amount now recorded. This was also 23 54″ below the average rainfall for 45 years (1890—1934) the average now being 90.90″ per annum. Maximum precipitation for Castries occurred on November 30th when a relatively low fall of 2.24″ was recorded and 4.02″ rainfall was recorded on the same date as the highest maximum precipitation for the Colony. No exceptional rain-storms occurred throughout the rainy season. The hurricane season was also bare of incident and as usual over a long period of years, the periodical revolving storms had no serious local effect.

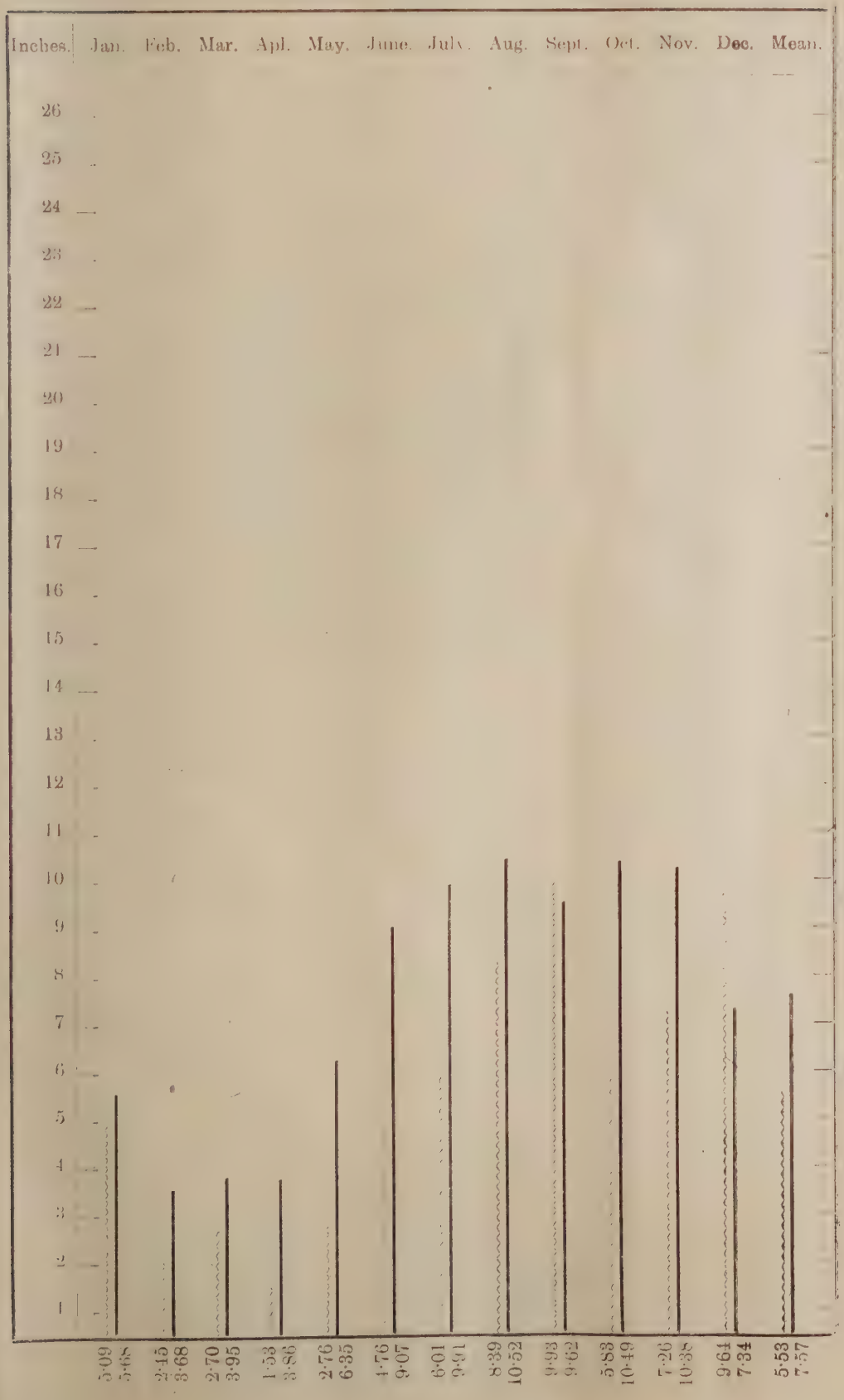
Weather: Dry and fine weather was the general meteorological feature, but the distribution of rains throughout the year was so well averaged that no general drought occurred. Slight losses were noticeable in the cane-fields due to failed plants and this was somewhat severe in the exposed southern cane-fields. Planting operations continued more or less generally throughout the year.

Temperature: As a result of constant prevailing winds with frequent northerly and westerly breezes and less clouds, radiation was increased and temperatures were lower, providing a welcome change of climate from that of recent wet years. The mean noon shade temperature was 83° F., the maximum temperature was 90°, the minimum temperature 64°, a reduced range of 26°.

Stations: The number of rainfall stations recording during the year was 36. The Agricultural Superintendent desires to thank recorders for their co-operation, and asks that this assistance be continued, as a means of building up a valuable record of rainfall statistics for the Colony.

APPENDIX III.

GRAPH OF MONTHLY RAINFALL—45 YEARS (1890—1934) CASTRIES, ST. LUCIA, B.W.I.



Legend.

——— Average for 45 years.

Rainfall during 1934.

APPENDIX IV.

RAINFALL RETURNS, 1934.

Observation Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Maximum in one day and date.		No. of days of rain.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Gros Islet, Reduit Estate	2·46	0·48	1·44	1·54	1·55	1·04	3·99	5·51	6·20	2·05	6·28	7·67	40·21	2·08	Nov. 7th	152
Castries, Corinth ,, ...	4·78	1·34	3·45	2·71	2·84	3·54	6·58	7·76	8·41	5·39	8·52	9·27	64·59	2·96	,, 30th	167
Marquis Estate ...	3·84	1·51	1·97	1·83	2·61	3·17	6·15	7·62	12·16	3·25	7·75	7·48	59·34	2·49	,, 30th	213
Union	2·86	0·94	2·81	1·02	1·40	1·66	4·36	8·66	12·01	5·69	7·82	9·34	58·57	2·63	,, 30th	257
Choc Estate ...	5·86	1·56	3·19	1·54	2·56	2·16	5·01	6·18	8·45	4·71	6·68	7·07	56·56	2·46	,, 30th	224
Botanic Gardens ...	5·09	2·45	2·70	1·53	2·76	4·76	6·01	8·39	9·93	5·83	7·26	9·64	66·35	2·24	,, 30th	263
The Barracks, Vigie ..	4·58	1·58	3·15	1·84	2·52	3·77	6·27	8·57	6·73	5·12	8·38	8·04	60·55	1·95	,, 30th	197
Soucis Est. Cul-de-Sac	6·09	1·69	2·52	2·22	3·36	4·03	9·69	10·63	10·57	7·30	7·44	9·76	75·30	2·66	Aug. 22nd	176
Crown Lands Est. ,,	11·11	5·85	8·21	4·33	10·70	7·36	9·43	11·72	13·05	7·37	10·34	9·42	108·89	3·03	Nov. 30th	269
Mont D'Or Est. ,, ...	5·11	3·26	3·35	2·16	2·32	5·60	9·58	12·06	9·17	5·87	7·49	11·35	77·32	3·05	Aug. 21st	205
Belair Estate, ,, ...	4·15	1·96	2·66	0·95	1·22	3·88	6·31	7·89	7·89	4·66	5·97	8·63	56·17	2·00	Dec. 4th	218
Vanard ,, ,, ...	6·45	...	3·13	...	3·49	6·03	9·26	12·99	9·28	7·40	7·94	11·45	77·42*	3·06	Aug. 21st	157
Roseau ,, ,, ...	4·18	2·64	3.21	1·01	...	3·53	8·23	9·26	7·50	5·69	5·71	10·80	61·76*	2·40	,, 21st	194
Ravine Poisson, Estate	6·80	2·40	4·45	2·25	4·45	4·94	11·68	10·45	9·92	7·91	8·47	9·84	83·56	2·80	,, 21st	166
Soufrière, La Perle Estate	7·78	2·53	2·81	2·69	5·25	4·35	6·59	11·98	11·93	6·83	6·57	14·72	84·03	3·33	Dec. 4th	200
Ruby Estate ...	6·17	...	...	...	...	...	...	...	..	...	...	...	6·17*	0·90	Jan. 14th	22
La Dauphine Estate ...	5·89	2·22	3·23	2·11	4·60	5·53	5·03	7·23	...	11·30	23·71	5·49	76·34*	7·00	Nov. 7th	161
Union Vale ,, ...	4·79	1·66	3·77	2·90	3·60	3·99	6·09	9·99	...	8·49	9·43	11·79	66·50*	2·10	Aug. 7th	195
Beausejour ,, ...	8·74	3·38	5·66	3·26	6·55	6·79	8·82	14·71	12·37	11·02	9·56	13·03	103·89	3·18	,, 7th	303
Belle Plaine ,, ..	8·74	3·21	5·12	3·67	6·50	6·23	8·36	14·68	12·63	10·48	9·77	13·04	102·43	3·43	,, 7th	301
†Rabot ,, ...	6·89	2·75	3·61	2·90	5·26	5·72	7·90	12·48	10·72	8·65	6·65	12·08	85·61	3·40	,, 7th	296
Choiseul, Morne Lezard Est.	6·13	1·64	4·04	1·69	2·61	5·88	4·68	10·82	7·08	6·07	8·45	8·57	67·66	2·55	,, 7th	238
Park Estate ...	6·40	2·09	5·51	2·32	4·53	5·39	7·44	11·72	11·27	9·27	9·67	10·62	86·23	2·90	Nov. 30th	272
Woodlands Estate ...	9·50	2·85	5·35	3·11	3·54	7·25	8·34	17·05	11·78	6·54	16·56	6·57	98·44	3·17	Aug. 7th	240
Laborie, Londonderry Est.	6·37	1·78	4·48	1·83	2·84	5·15	5·47	10·40	7·63	6·97	8·49	8·97	70·38	1·95	,, 7th	235
Giraud Estate ...	7·98	1·10	4·72	1·98	3·98	4·99	7·70	12·04	11·24	8·40	11·67	8·86	84·66	2·84	Sept. 6th	181
Black Bay Estate ...	3·95	1·55	3·39	1·00	1·92	3·78	4·56	8·94	7·07	3·94	6·67	7·80	54·57	1·63	Aug. 21st	130
Vieux-Fort, Retraite Est.	4·41	0·33	3·00	1·17	2·25	5·18	4·09	9·42	4·80	3·69	8·36	7·82	54.52	2·50	,, 7th	141
Moule-à-Chique Estate	1·54	1·34	1·60	0·60	2·38	3·50	2·85	5·10	5·23	4·86	6·22	6·21	41·43	1·47	Nov. 28th	88
Beausejour Estate ...	3·04	0·39	1·87	0·97	1·15	3·40	3·67	8·08	...	...	...	...	22·57*	2·20	Aug. 7th	63
Pointe Sable ,, ...	2·41	1·15	2·21	0·47	2·51	3·84	4·04	6·91	5·63	2·65	6·96	6·28	45·06	1·69	,, 7th	131
Micoud, Troumassée Est.	3·00	2.00	4·00	5·50	5·10	2·00	6·65	7·73	5·50	4·60	8·10	8·00	62·18	3·00	Nov. 29th	74
†Daubaignan ,, ...	3·25	1·67	3·84	1·45	4·51	5·37	6·20	5·14	11·21	5·15	...	...	47·79*	1·95	July 4th	189
Dennery, Mamiku Estate	3·76	1·15	3·36	1·11	2·33	2·43	3·69	8·34	8·14	4·75	6·05	7·24	52·35	2·35	Aug. 21st	243
Prospect ,, ..	5·89	2·47	3·55	1·77	4·27	4·37	7·71	10·52	9·13	6·77	11·62	9·46	77·53	4·02	Nov. 30th	280
Border ,, ...	5·36	1·92	3·49	1·89	2.41	3·83	5·03	9·38	9·67	4·95	8·31	10·46	66·70	3·24	Aug 21st	261

* Record not complete. † New Station.

	Crown Lands.	La Dauphine.	Beausejour Souf.
Maxima=	108·89	7·00—Nov. 7th.	303

GRAPH of RAINFALL of the BOTANIC GARDENS, Castries during the period 1890—1934.

REVISED PRICES OF NURSERY PLANTS AND SUPPLIES.

1. The prices of plants do not include the cost of the box or package, for which a charge will be made if not returned to the Department. The cost of delivery is usually included in the prices. Exceptions to this rule will be made at the discretion of the Agricultural Superintendent.

2. All prices specified are for plants of standard quality. The prices of plants not included in this list will be fixed by the Agricultural Superintendent.

3. An addition of 100% is made on the price of all plants supplied for export from the Colony.

4. No plants are supplied on Public Holidays.

5. At least six months previous notice must be given when large numbers of such plants as bananas, coconuts, coffee, cacao, nutmegs, citrus, cane plants, &c., are required. All such orders should be in writing, and verbal or telephone messages should be confirmed in writing. In default of this rule such orders may not be attended to.

6. All orders will be supplied subject to the discretion of the Agricultural Superintendent and no responsibility is taken in regard to quality or quantity of plants after despatch from the Nurseries.

7. Complaints as to the quality or quantity of plants, etc., supplies, or as to the prices charged, should be made in writing to the Agricultural Superintendent at the time of delivery.

I. PLANTS.

	s.	*d.*	
Banana Plants (sections or suckers)		1	per plant (undelivered).
Oranges Budded		3	per plant.
Oranges Sour		6	per hundred.
Grapefruit Budded		3	per plant.
Lime Plants Budded/Grafted		3	per plant.
Mangoes Budded/Grafted		6	to 1*s.* per plant.
Coffee Plants	1	0	to 2*s.* per hundred.
Cacao Budded		2	per plant.
Nutmegs Grafted		6	per plant.
Avocado Pears		2	to 3*d.* per plant.
Avocado Grafted		2	to 3*d.* per plant.
Cane Plants	1	0	per hundred (undelivered).
Pineapple Plants		1	to 3*d.* per plant.
Eucalyptus	2	0	per hundred.
Casuarina	2	0	per hundred.
Palms (various)		3	per plant.
Ornamental Plants (various)		2	to 1*s.* per plant.
Seeds (various)		3	per packet.
Plants for windbreaks, hedges, etc., other than the above mentioned	2	0	per hundred.
Grass and Fodder Plants	1	0	to 2*s.* per hundred (undelivered).
Cover Crops and Green Manures		2	per lb.

II. FUNGICIDES, INSECTICIDES, AND SUNDRIES.

Prices subject to change without notice.

		s.	*d.*
Sulphemulsol, fungicide and insecticide ...	per gal.	1	4
Carbon bi-sulphide	per gal.	2	4
Paris Green	per lb.	1	4
Copper Sulphate	per lb.	0	8
Soil Insecticide	per lb.	0	5
Whale-oil Soap (concentrated)	per lb.	0	11
Gas-oil—Panama disease killer	per gal.	0	10
Cattle Tick Wash (concentrated)	per gal.	5	3
Sheep and Dog Tick Wash (concentrated) ...	per gal.	3	5
Tobacco Insecticide (XLALL concentrated) ...	per pint	3	0
Ostico grease banding	per lb.	1	3
Raffia	per lb.	1	4

III. FERTILISERS AND MANURES.

Prices subject to change without notice. Quotations based on market prices.

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H. E. BOX, F.E.S. (attached)	Entomologist.

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E. R. LEONARD, B.SC., A.R.C.S.	Plant Physiologist, Low Temperature Research Station.
F. J. PUND, B.SC.	Officer for Cacao Research.
E. E. PYKE, B.SC., A.R.C.S.	Officer for Cacao Research.
J. A. MCDONALD, Dip. Agr., A.I.C.T.A. ...	Officer for Cacao Research.

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